Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended



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The undersigned prepared this Technical Report (Technical Report), titled: *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended***,** dated the 24th day of July, 2014, with an effective date of January 31, 2014, in support of the public disclosure of Mineral Resource estimates for the Fire Creek Project. The format and content of the Technical Report have been prepared in accordance with Form 43-101F1 and National Instrument (NI) 43-101 of the Canadian Securities Administrators.

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List of Selected Abbreviations

A	ampere
AA	atomic absorption
A/m^2	amperes per square meter
ANFO	ammonium nitrate fuel oil
Ag	silver
Au	Gold
AuEq	gold equivalent grade
°C	degrees Centigrade
CCD	counter-current decantation
CIL	carbon-in-leach
CoG	cut-off grade
cm	centimeter
cm^2	square centimeter
cm^3	cubic centimeter
cfm	cubic feet per minute
ConfC	confidence code
CRec	core recovery
CSS	closed-side setting
CTW	calculated true width
°	degree (degrees)
dia.	Diameter
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
FA	fire assay
Ft	foot
Ft^2	Square foot
Ft^3	Cubic foot
g	Gram
g/L	gram per liter
g-mol	gram-mole
g/t	grams per tonne
ha	hectares
HDPE	Height Density Polyethylene
HTW	horizontal true width
ICP	induced couple plasma
ID2	inverse-distance squared
ID3	inverse-distance cubed
ILS	Intermediate Leach Solution
kA	kiloamperes
kCFM	thousand cubic feet per minute
kg	kilograms
km	kilometer
km2	square kilometer
kWh/t	kilowatt-hour per ton
L	liter
L/sec	liters per second
L/sec/m	liters per second per meter
LLDDP	Linear Low Density Polyethylene Plastic
LOI	Loss On Ignition
LOM	Life-of-Mine
m	meter
m^2	square meter
m^3	cubic meter
masl	meters above sea level
mg/L	milligrams/liter
mm	millimeter
mm^2	square millimeter
mm^3	cubic millimeter
MME	Mine & Mill Engineering
Moz	million troy ounces
Mt	million tonnes
MTW	measured true width
MW	million watts
m.y.	million years
NGO	non-governmental organization
NI 43-101	Canadian National Instrument 43-101
oz	Troy Ounce
opt	Troy Ounce per short ton
%	percent
PLC	Programmable Logic Controller
PLS	Pregnant Leach Solution
PMF	probable maximum flood
ppb	parts per billion
ppm	parts per million
QAQC	Quality Assurance/Quality Control
RC	Reverse circulation drilling
RoM	Run-of-Mine
RQD	Rock Quality Description
SEC	U.S. Securities & Exchange Commission
sec	second
SG	specific gravity
SPT	standard penetration testing

1 Summary

Practical Mining LLC was engaged by Klondex Gold & Silver Mining Company (KGS), U.S. subsidiary of Canadian based Klondex Mines Ltd. (Klondex or the Company), to prepare a Preliminary Economic Assessment (PEA) in accordance with National Instrument 43-101 (NI 43-101) of the Canadian Securities Administrators. Practical Mining's evaluation of the Fire Creek Project (Fire Creek or the Project), located in Lander County, Nevada, is presented herein. This report, dated the 24th day of July, 2014, with an effective date of January 31, 2014, updates the previous mineral resource estimate (Odell et al., 2013). The lineage of technical reports on Fire Creek as is continued in this Technical Report includes:

1. 2006 NI 43-101 Technical Report: Ullmer, Edwin, and Hawthorn, Gary W., 2006: Fire Creek Gold Property, Lander Co., Nevada, September 15, 2006;

2. 2009 NI 43-101 Technical Report: Updated Report on the Fire Creek Gold Property, Lander Co., Nevada, March 30, 2009;

3. 2011 NI 43-101 Technical Report: Raven, Wesley, Ullmer, Edwin, Hawthorn, Gary W., 2011: Updated Technical Report and Resource Estimation on the Fire Creek Gold Property, Lander County, Nevada; and

4. 2013 NI 43-101 Technical Report: Odell, Mark, Swanson, Karl and White, Michele, 2013: Technical Report (Amended), Fire Creek Exploration Project, Lander County, Nevada.

Fire Creek is located in Lander County in north-central Nevada about 16 miles south of Interstate Highway I-80. The property is centered on latitude 46.4627° North (N) and longitude 116.6518° West (W), (40.472024, -116.658325 Universal Transverse Mercator [UTM]). Most of the current exploration is within Sections 15 and 22 of Township 30 North, Range 47 East. Klondex controls a total of 11,307 acres (17.7 square miles) which includes 484 claims, or 9,680 acres; 1,118 acres of private fee land; 239 acres of mineral leases; and 270 acres with options to purchase.

The mineralization at Fire Creek is a shallow, low-sulfidation, vertically-zoned, epithermal gold-silver system. The mineralization occurs in two habits: disseminated gold in argillically altered tertiary basalt; and as clots, stringers, and visible gold in steeply dipping epithermal quartz-calcite veins. The basalt flows and intrusions are sub-horizontal and are cross-cut by high-angle normal faults forming regional grabens. These structures trend parallel to the north-northwest striking Northern Nevada Rift (NNR). High-grade gold mineralization occurs within veins and is disseminated in the basalt near vertical structures of an epithermal system.

A high-grade gold horizon occurs at approximately 300 feet to about 600 feet below the surface, with mineralization occurring from the surface and open at depth. Vein textures, gangue minerals, and alteration at Fire Creek are classic epithermal phenomena. The mode of argillic alteration of the basalts was by flooding of the matrix and replacement of micro-phenocrysts in dissolution-style fronts. The result is chemical brecciation of the basalt by dissolution associated with elevated gold deposition. The gold habit occurs as free crystalline gold and as gold associated with pyrite in quartz-calcite-pyrite veins. The mineralization occupies portions of the veins as high-grade shoots deposited under preferential conditions within the veins and in the adjacent basalt. There is a remnant of the opaline silica cap, the sinter, above the deeper mineralization. Three geotechnical drill holes intercepted mineralization at the surface, near the vent raise. Mineralization in faults near the sinter was targeted by early prospecting and later shallow drilling by previous owners and lessees of the Project through the 1980s.

A history of Fire Creek ownership is itemized below:

Table 1-1 Chronology of Ownership of the Fire Creek Project

Dates	Company	Details
1967	Union Pacific Resources	Drilled two core holes
1974 to 1975	Placer Development Ltd.	Drilled 22 holes
1975	Klondex Mines Ltd.	Acquired the property.
1984	Minex Resources, Inc.	Leased the property from Klondex.
1986 to 1987	Alma American Mining Company (“Alma”)	Alma leased the property.
1988	Aurenco Joint Venture (“Aurenco JV”)	Aurenco JV formed between Black Beauty Mining and Covenanter Mining.
1988 to 1990	Aurenco JV	Leased the property from Klondex.
1990 to 1995	Klondex Mines Ltd.	No activity.
1995 to 1996	North Mining Inc. (“North Mining”)	North Mining leased the property from Klondex.
1996 to 2004	Klondex Mines Ltd.	No activity.
2004 to 2012	Klondex Mines Ltd.	Began a deep exploration program.
2012 to Present	Klondex Mines Ltd.	New management and board of directors.

Current drilling programs conducted by Klondex define two major north-northwest striking vein arrays comprised of several separate en echelon veins. Interpretations of Gradient-Induced Polarization (IP) survey define new target areas from geophysical responses indicative of potential mineralization based on similar signatures observed at proven targets. Future drilling of these new targets should determine if these geophysical anomalies represent possible vein systems outside the boundaries of the current drilling area.

This Technical Report documents the Fire Creek mineral resource estimate based on topographic aerial photogrammetric survey conducted by Olympus Aerial Surveying in Salt Lake City, Utah during 2008 and drilled data and underground sampling data produced through January 31, 2014. This Technical Report is dated July 24, 2014 and the effective date for this Technical Report is January 31, 2014.

1.1 Mineral Resource Estimate

The mineral resource estimate is based on data from 408 surface and underground drill holes, through January 31, 2014, and includes information obtained from re-logging 228,814 feet of core in 2013. This estimate also includes 1,120 independently assayed rib, back, and face channel samples from underground drifting on the Joyce and Vonnie structures (the Joyce Vein and Vonnie Vein, respectively). Infill drilling on 75 feet centers, in conjunction with the underground development program, increased the confidence level of the mineral resource estimate. As a result, the portions of the Joyce Vein and Vonnie Vein accessed by underground development are included in the measured category in the mineral resource estimate.

Wire frame solid models were constructed for 32 vein shoots striking approximately N15W and steeply dipping both east and west. The vein models were constructed from cross sections on 25-foot intervals. Assay values were composited into 10-foot lengths and truncated at the vein hanging wall and footwall. Only composites flagged as representing vein material were used in the grade estimation. Grades greater than the capped value of 19 ounces per ton (opt) were restricted to the block containing the intercept. Grades were assigned to individual blocks using the inverse distance cubed method (ID^3).

The search orientation for each of the 32 veins was determined based on the individual veins approximate strike and dip. Measured blocks require a minimum of five drill hole intercepts or channel samples within 25 feet, while indicated blocks required two within 100 feet. Inferred blocks also required two but the maximum distance increased to 1,000 feet. Grades were estimated for only blocks contained within the modeled vein wireframe. Block extents are five feet long along strike and oriented vertically. Perpendicular to strike, the block extents were limited to the width of the vein with 0.5-foot resolution. This method allows veins as narrow as 0.5-foot to be modeled accurately.

Mineral resources were estimated for only blocks within the modeled vein lenses. A halo of low grade mineralization within the altered wall rocks immediately adjacent to the veins (Halo) was not estimated and has been excluded from the mineral resource estimate described in this Technical Report. The gold grade in this Halo ranges from 0.1 to 1 opt (3 gpt and 30 gpt) and is not included in the resource model.

The mineralized vein arrays extend over 5,000 feet along strike and from near surface to 1,000 feet in depth. These vein arrays are open on strike and at depth.

A density of 0.0774 tons per cubic foot was used for all veins. This value was derived from 15 samples collected from the Joyce Vein and Vonnie Vein and analyzed by SGS North America Inc (SGS) of Elko, Nevada, an independent laboratory. The SGS (Elko) laboratory forms part of the SGS Minerals' global group of laboratories. The SGS (Elko) laboratory is not independently certified by a standards association but is associated with the SGS (Vancouver) laboratory, which is an ISO 9001:2008 accredited facility.

Table 1-2 Fire Creek Project Mineral Resources

Resource Class	Imperial Units				
Zone	Mass (000's Tons)	Gold Grade (opt)	Silver Grade (opt)	Contained Gold (000's oz.)	Contained Silver (000's oz.)
Measured					
Main	*21*	*1.69*	*1.10*	*36.2*	*23.7*
North	*1*	*1.49*	*0.69*	*0.9*	*0.4*
Total Measured	**22**	**1.68**	**1.09**	**37.1**	**24.1**
Indicated					
Main	*80*	*1.88*	*1.19*	*150.7*	*95.7*
West	*15*	*0.68*	*0.49*	*10.4*	*7.5*
North	*44*	*1.03*	*0.59*	*45.2*	*25.9*
South	*39*	*0.53*	*0.67*	*20.8*	*26.3*
Far North	*34*	*0.57*	*0.45*	*19.5*	*15.4*
Total Indicated	**213**	**1.16**	**0.80**	**246.5**	**170.8**
Measured and Indicated					
Main	*102*	*1.84*	*1.17*	*186.8*	*119.4*
West	*15*	*0.68*	*0.49*	*10.4*	*7.5*
North	*45*	*1.04*	*0.59*	*46.1*	*26.3*
South	*39*	*0.53*	*0.67*	*20.8*	*26.3*
Far North	*34*	*0.57*	*0.45*	*19.5*	*15.4*
Total Measured and Indicated	**235**	**1.21**	**0.83**	**283.6**	**194.9**
Inferred					
Main	*70*	*1.11*	*0.87*	*77.6*	*60.3*
West	*58*	*0.68*	*0.43*	*39.4*	*24.8*
North	*261*	*0.67*	*0.37*	*174.9*	*95.7*
South	*12*	*0.62*	*0.25*	*7.4*	*3.0*
Far North	*226*	*0.55*	*0.43*	*124.5*	*97.0*
Total Inferred	**627**	**0.68**	**0.45**	**423.9**	**280.9**

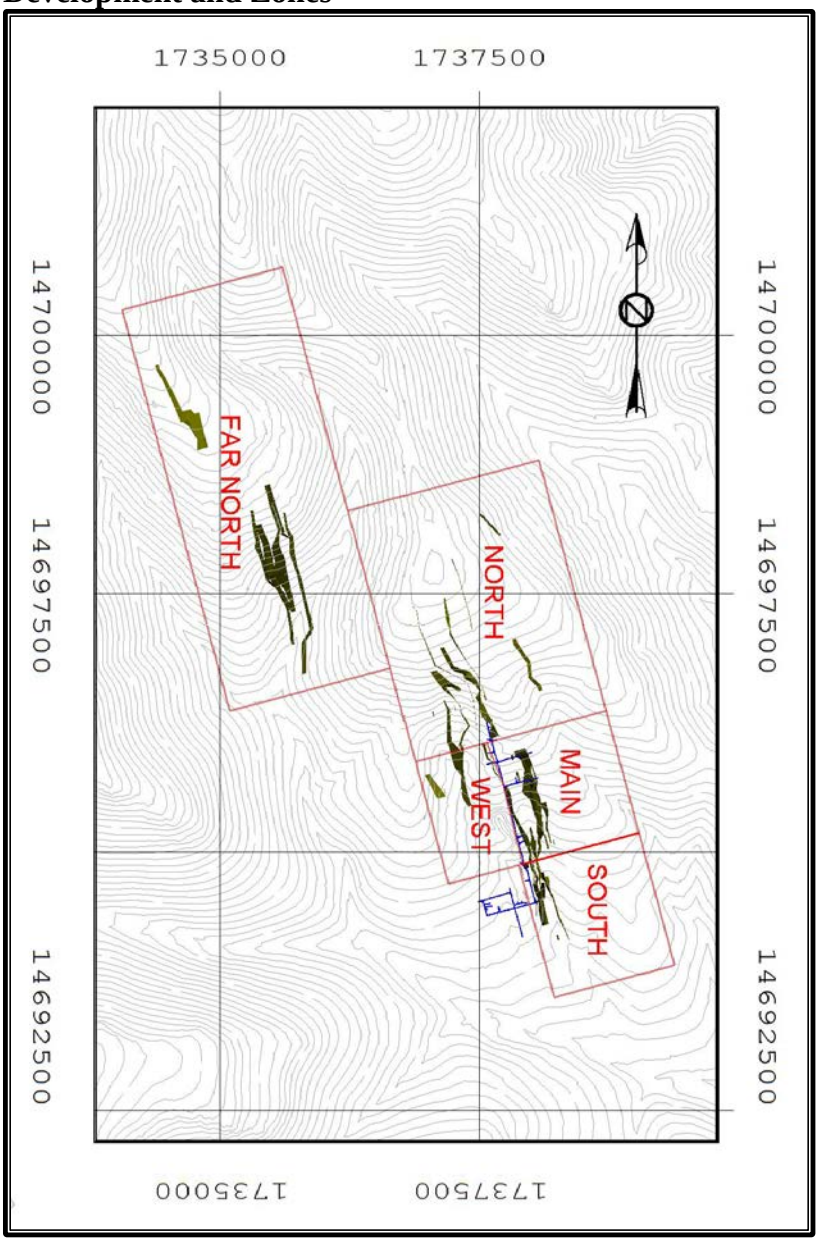
Notes:

1. *Mineral resources, which are not mineral reserves, do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, socio-political, marketing, or other relevant issues;*
2. *The quantity and grade of reported inferred mineral resources in this estimation are uncertain in nature, and there is insufficient exploration to define these inferred mineral resources as an indicated or measured mineral resource, and it is uncertain if further exploration will result in upgrading them to an indicated or measured mineral resource category; and*



3. *Mineral resources have been estimated at a cut-off grade of 0.227opt (7.8 g/t) calculated with a $1,250 per ounce gold price and $18 per ounce silver price.*

Figure 1-1 Fire Creek Project Overview Showing Vein Locations, Underground Development and Zones



1.2 Preliminary Economic Assessment Mine Plan and Financial Analysis

End slice stopes were designed using the Vulcan Software stope optimizer module and the updated Fire Creek mineral resource model. Stope development levels are spaced at vertical intervals of 40 feet. Stope mining widths are either four feet or the horizontal vein width plus two

feet, whichever is greatest. Only stopes with an average grade in excess of 0.23 opt were considered for inclusion in the life of mine plan (LOM).

The LOM design includes capital and expensed waste development excavations in addition to the mineralized excavations. All of the excavations were linked in sequence to create the LOM development and production schedule. Sequences of mineralized and waste excavations that did not achieve a positive cash flow were subsequently removed from the plan. The LOM plan is summarized in Table 1-3.

Table 1-3 Life of Mine Plan Summary

Mineral Resource Mined		
Measured and Indicated	Thousand (K) tons	243
	Gold Grade (opt)	0.76
	Silver Grade (opt)	0.45
	Gold k ounces	185
	Silver k ounces	110
Inferred	k tons	196
	Gold Grade (opt)	0.57
	Silver Grade (opt)	0.21
	Gold k ounces	112
	Silver k ounces	41
Waste Development		
Capital Drifting	feet	20,139
Capital Raising	feet	383

The Fire Creek PEA mine plan only includes mineral resources within the veins which can be readily accessed from the existing development platform. The majority of mineral resources in the North Zone and all of the mineral resources in the Far North Zone were not considered in the current mine plan due to the mine development requirements for these zones. As additional exploration information is gained, the mine plan may be extended to the north to include these mineral resources.

Additionally, some of the mineral resources near the current development platform are contained in veins of insufficient width to meet cut-off grades when minimum mining widths are applied. Alternative mining methods which reduce dilution and/or development requirements should be investigated for the extraction of these mineral resources.

Table 1-4 summarizes the operating and financial performance calculated using costs associated with the exploration and mining of the Fire Creek veins and associated mineral processing at the Company's Midas Mill in Elko County, Nevada. The constant dollar cash flow presented

includes project level capital and operating expenditures. Corporate level spending including financing costs are not included in the cash flow analysis. Specifically, the gold delivery obligations of Klondex under the gold purchase agreement between Klondex and Franco-Nevada GLW Holdings Corp., a subsidiary of Franco-Nevada Corporation (FNC), dated February 11, 2014 (the Gold Purchase Agreement), are not included.

This preliminary economic assessment is preliminary in nature, and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the preliminary economic assessment will be realized. Mineral resources that are not mineral reserves do not have demonstrated viability.

Table 1-4 Key Operating and Financial Statistics

Description	Value
Material Mined and Processed (kt)	439
Avg. Gold Grade (OPT)	0.68
Avg. Silver Grade (OPT)	0.34
Contained Gold (koz)	297
Contained Silver (koz)	151
Avg. Gold Metallurgical Recovery	94%
Avg. Silver Metallurgical Recovery	92%
Recovered Gold (koz)	279
Recovered Silver (koz)	139
Mine Life (years)	5
Cash Cost ($/oz)	$459
Total Cost ($/oz)	$636
Gold Price ($/oz)	$1,250
Silver Price ($/oz)	$18
LoM Capital Cost ($ Millions)	($49.6)
Payback Period (years)	0.5
Cash Flow ($ Millions)	$157.3
5% Discounted Cash Flow ($ Millions)	$141.5
10% Discounted Cash Flow ($ Millions)	$128.3
Profitability Index [1]	4.1
Internal Rate of Return	N/A

Notes:

1. *Profitability index (PI), is the ratio of payoff to investment of a proposed project. It is a useful tool for ranking projects because it allows you to quantify the amount of value created per unit of investment. A profitability index of 1 indicates break even.*

1.3 Conclusions

The high mineralization average grade of 0.76 opt gold at Fire Creek allows the project to maintain positive economics with up to 40% negative variations in any one of gold price, operating costs, or capital expenditures. Alternative mining methods such as shrinkage stoping or modified resue mining may reduce the total cost per ounce of gold by limiting dilution, both planned and unplanned, or by reducing the capital development requirements.

Exploration at Fire Creek has identified several high-grade epithermal vein arrays. Significant progress made during the past 24 months has enhanced the Company's knowledge and understanding of the geology and style of mineralization associated with the project.

1.4 Recommendations

- Develop access to the Joyce Vein and Vonnie Vein from a second level initiated a few hundred feet south of the existing crosscuts to these veins. Initiate test stoping between the two levels as soon as practical;
- Modify permit and construct a backfill plant capable of providing cemented rock fill with unconfined compressive strengths up to 800 pounds per square inch (psi);
- Continue infill drilling near the existing development to advance inferred resources to the indicated or measured category;
- Complete a sampling program to drill and model wall rock alteration and mineralization in the Joyce Vein and Vonnie Vein drifts;
- Continue with surface and underground exploration programs at Fire Creek, including the North, Far North, and South zones;
- Expand the Quality Assurance and Quality Control (QAQC) program to include sample assaying at a second independent laboratory;
- Improve the site data storage and security;
- Upgrade existing communication system;
- Maintain underground survey control by implementing closed loop traverses to validate the integrity of bearing and coordinate measurements; and

- In order to support further development and exploration, the rapid infiltration basins (RIBs) should be constructed, which will enhance water management.



2 Introduction

2.1 Terms of Reference and Purpose of this Technical Report

This report provides Klondex a preliminary economic assessment of the Fire Creek mineral resource. This evaluation includes measured, indicated and inferred resources. This report was prepared in accordance with the requirements of NI 43-101 and form 43-101F1 (43-101F1) for technical reports.

Mineral resource definitions are set forth in Section 27 of this Technical Report in accordance with the companion policy to NI 43-101 (43-101CP) of the Canadian Securities Administrators and "*Canadian Institute of Mining, Metallurgy and Petroleum (CIM) – Definitions adopted by CIM Council, November 27, 2010*."

2.2 Qualifications of Consultants and Authors

This Technical Report includes technical evaluations from four independent consultants. The consultants are specialists in the fields of geology, geological engineering, exploration and mining data management, mineral resource and mineral reserve estimation and classification, and mine engineering including open pit and underground mining.

None of the authors has any beneficial interest in Klondex or any of its subsidiaries or in the assets of Klondex or any of its subsidiaries. The authors will be paid a fee for this work in accordance with normal professional consulting practices.

The individuals who have provided input to the current Technical Report are cited as "author" and are listed below with the dates on which they visited the Project. These authors have extensive experience in the mining industry and are members in good standing of appropriate professional institutions.

Mr. Odell visited Fire Creek on June 27, 2013, September 6, 2013, and November 25, 2013;

Ms. Symmes visited Fire Creek on June 27, 2013, September 6, 2013, November 12, 2013 and December 17, 2013;

Ms. Bull has not visited the project site, and;

Mr. Swanson visited Fire Creek on September 6, 2013.

Mr. Odell is the qualified person (QP) for this Technical Report and is cited as "primary author."



Mr. Odell, Ms. Symmes and Mr. Swanson inspected the underground mining operations and reviewed the site geology. Ms. Symmes was responsible for reviewing the core drilling and sampling procedures, core handling and security procedures, data management, and the site geology. Ms. Bull was responsible for reviewing the underground mine design. In addition, Ms. Symmes and Mr. Odell reviewed reports detailing the Company's land position at the Project. The key project personnel contributing to this report are listed in Table 2-1. The Certificate and Consent Forms are provided in Appendix A.

Table 2-1 Qualified Professionals

Company	Name	Title	Discipline
Practical Mining, LLC	Mark Odell	Primary Author & Mining Engineer	Mining and mineral resources
Practical Mining, LLC	Laura Symmes	Sr. Geologist	Geology
Practical Mining, LLC	Sarah Bull	Mining Engineer	Mining
Independent Consultant	Karl Swanson	Consulting Geologist	Resource model and geology

2.3 Sources of Information

The sources of information include data and reports supplied by Klondex staff.

In addition, information was included in the Technical Report based on discussions with Klondex staff related to their field of expertise with the Project. Required financial data and operating statistics were also provided by Klondex staff.

Sources of information are documented either within the text and cited in references, or are cited in references only. The primary author believes the information provided by Klondex staff to be accurate based on their work at Fire Creek. The authors asked detailed questions of specific Klondex staff to help verify and clearly state contributions included in this document. These contributions are clearly stated within the text.

2.4 Units of measure

The units of measure used in this report are shown in Table 2-2 below. U.S. Imperial units of measure are used throughout this document unless otherwise noted. The glossary of geological and mining related terms is also provided in Section 27 of this Technical Report.

Table 2-2 Units of Measure

US Imperial to Metric conversions
Linear Measure
1 inch = 2.54 cm
1 foot = 0.3048 m



1 yard = 0.9144 m
1 mile = 1.6 km
Area Measure
1 acre = 0.4047 ha
1 square mile = 640 acres = 259 ha
Weight
1 short ton (st) = 2,000 lbs = 0.9071 tonne (t)
1 lb = 0.454 kg = 14.5833 troy oz
Assay Values
1 oz per short ton = 34.2857 g/t
1 troy oz = 31.1035 g
1 part per billion = 0.0000292 oz/ton
1 part per million = 0.0292 oz/ton = 1g/t

2.5 Coordinate Datum

Spatial data utilized in analysis presented in this Technical Report are projected to Nevada State Plane Central Zone North American Datum 1983 (Nv SPCS) feet. All spatial measurement units used in the mineral resource estimate are U.S. Imperial feet, and currency is expressed in United States dollars unless stated otherwise.

Survey data was collected and reported using several coordinate systems. Historically, survey data was originally collected in NAD83 meters as a default in the instrumentation settings, and then the data was converted to NAD83 feet for reports as requested by Klondex staff in Nevada. Klondex's Nevada staff further converted the data from NAD83 feet to UTM NAD27 Zone 11N feet. Early in 2014, all the project data was again converted to Nv SPCS coordinates.

In addition, downhole surveys were collected without compensating for regional declination. Klondex staff applied corrections to raw downhole survey data to compensate for the local declination at the Fire Creek, which is 13.35 degrees according to the National Oceanic and Atmospheric Administration (NOAA) calculator.



3 Reliance on Other Experts

The technical status for the claims and land holding is reliant on information provided by W.G. (Bill) Houston, Registered Professional Landman (RPL), an independent land consultant to Klondex. The status of the Klondex environmental program and mine permitting process were provided by Ms. Lucy Hill, Klondex Environmental Manager. Costs and projections were provided by Dr. Shuai Chen, Chief Engineer. These contributions are presented on the assumption that they are accurate portrayals at the time of writing this document.

Observations made on-site by the authors include overseeing all aspects of mining activities including: underground core drilling, labeling core boxes, moving core, splitting core, safety procedures, haulage and equipment maintenance, water treatment, security, road maintenance, general geology, and character of mineralization.

The authors reviewed land tenure to verify the nature of the good standing with regulating authorities and the Bureau of Land Management (BLM) Klondex's unpatented lode mining claims as well as a title opinion report dated February 11, 2014, written by Erwin & Thompson LLP. The legal status or ownership of the fee properties and/or any agreements that pertain to the Fire Creek mineral deposit were provided by Mr. Houston, RPL, independent land consultant to Klondex for all relevant mining claims. Assumptions made as to accuracy of land tenure are based on his opinion.

The opinions expressed in this Technical Report are based on the authors' field observations and assessment of the technical data in respect of the Fire Creek Project.

4 Property Description and Location

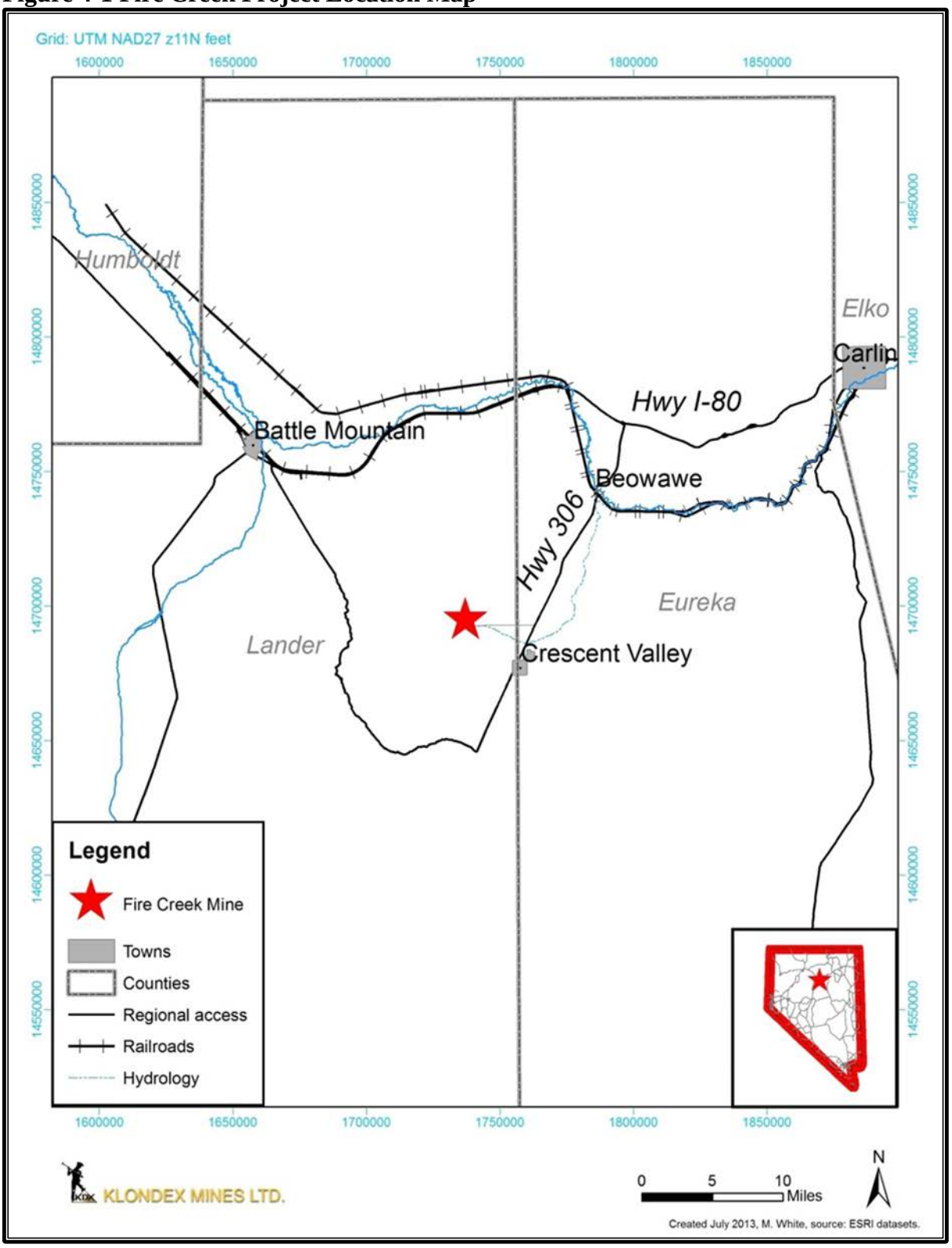
4.1 Property Description

The property comprising the Fire Creek Project is a high-grade volcanic rock-hosted gold-silver deposit in faulted and brecciated basalt related to a Tertiary rift. The deposit is located in Lander County, approximately 63 miles west of the major city of Elko, Nevada, USA in a sage and grass covered alluvial hillside overlooking the Crescent Valley. There are multiple small towns along paved highways within a short commute to the Project, and the northern edge of the residential area of the town of Crescent Valley abuts the mine access road. The coverage of the property is 11,307 acres.

4.2 Property Location

Fire Creek is located in Lander County, Nevada, approximately 34 miles west of Carlin (or 63 miles west of Elko) and 15 miles south of Highway I-80 (Figure 4-1). The closest town to the Property is Crescent Valley on Nevada State Highway 306. Access from Elko takes approximately one hour.

Figure 4-1 Fire Creek Project Location Map



4.3 Status of Mineral Titles

Klondex's property position consists of a combination of privately owned fee land, leased fee land and owned unpatented mining lode claims. Figure 4-2 depicts the current Project boundary and land status. The land position shown on Figure 4-2 includes approximately 9,680 acres of unpatented federal lode mining claims, 1,118 acres of private fee land, 239 acres of mineral leases, and 270 acres with options to purchase. Overall, Klondex controls approximately 11,307 acres.

Figure 4-2 Fire Creek Project Boundary and Land Status

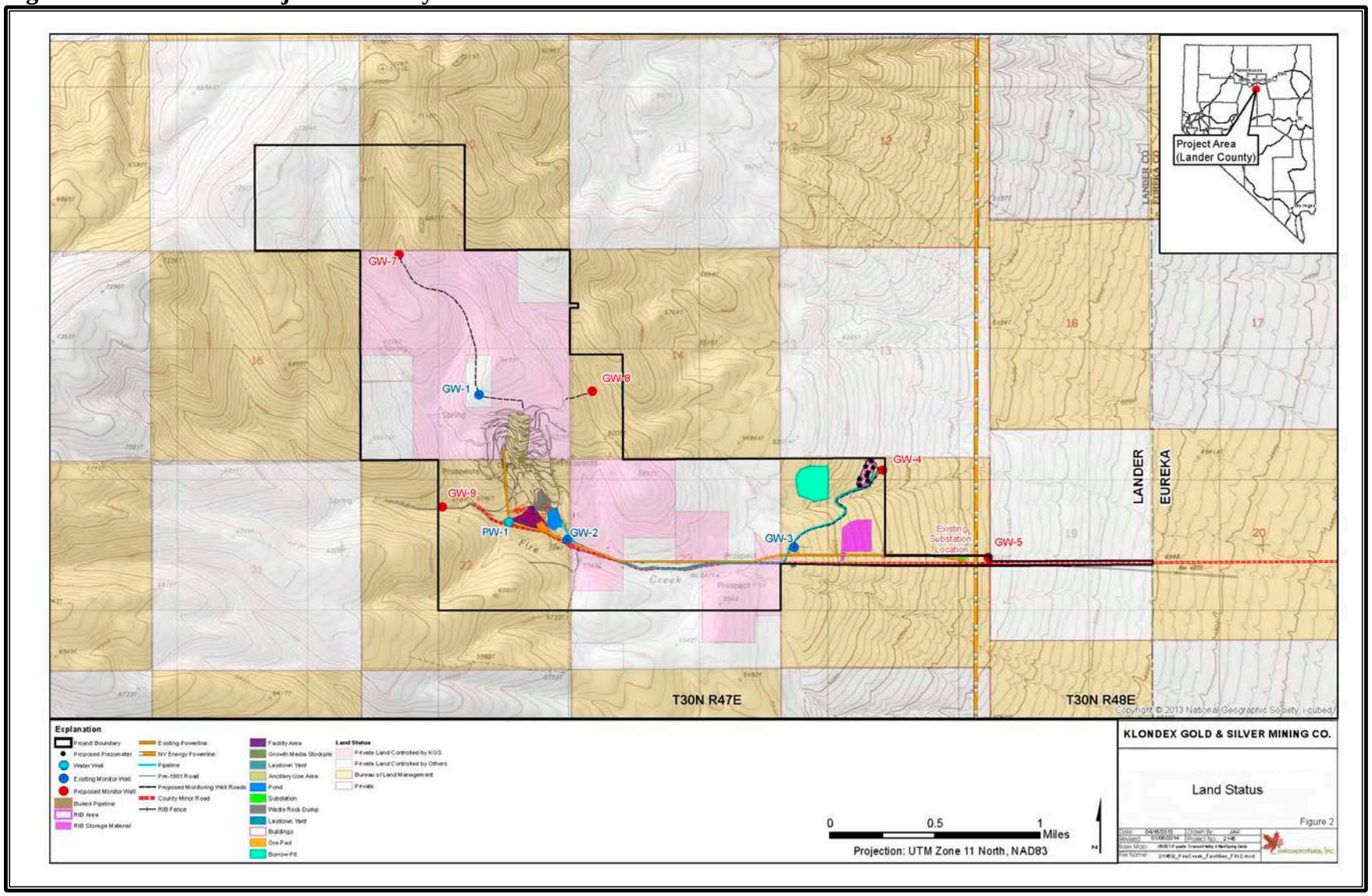


Table 4-1 through Table 4-3 itemize the vestment of titles to 484 unpatented lode mining claims and fee lands held by KGS and are in current good standing through September 2014.[1]

Table 4-1 Summary of Fire Creek Project Unpatented Lode Mining Claim Holdings

Claim Name	Section	Township	Range	Location Date	Number of Claims
Wood Tick 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22	2	30N	47E	18-Jul-1987	11
Wood Tick 24, 26, 28, 30, 32, 34, 36	2	30N	47E	18-Jul-1987	7
Wood Tick 38, 40, 42, 44, 46, 48, 50, 52	36	31N	47E	21-Jul-1987	8
G 1 - G 16	26	30N	47E	23-Jan-1990	16
Deb #2, #4	34	30N	47E	13-Dec-1991	2
Revenge 2, 20	34	30N	47E	16-Dec-1991	2
Revenge 4, 6, 8	34	30N	47E	17-Dec-1991	3
Revenge 10, 12, 14	34	30N	47E	18-Dec-1991	3
Revenge 22	34	30N	47E	9-Jan-1992	1
Revenge 28	34	30N	47E	26-Jan-1992	1
Revenge 16, 18	34	30N	47E	6-Feb-1992	2
Revenge 24, 26	34	30N	47E	13-Feb-1992	2
K 1 - 20 [1]	16	30N	47E	25-Jun-1992	20
K 21 - 27 [2]	16	30N	47E	26-Jun-1992	7
Alan 1-14	31	30N	47E	15-Feb-1993	14
N 2, 4, 6, 8, 10,12, 14, 16, 18	32	30N	47E	17-Nov-1993	9
N 20, 22, 24, 26, 28, 30	32	30N	47E	18-Nov-1993	6
TL 2, 4, 6	20	30N	47E	8-Nov-1993	3
TL, 8, 10, 12, 14, 16, 18	20	30N	47E	10-Nov-1993	6
TL, 20, 22, 24, 26	20	30N	47E	21-Jun-1994	4
FCRA 1 - 20	26	30N	47E	28-Sep-1995	20
T 1 - 10	14	30N	47E	13-Oct-1991	10
T 11 - 18, 27 - 36	14	30N	47E	24-Sep-2003	18
T 19, 21 - 26	14	30N	47E	23-Sep-2003	7
T 20	10, 14 & 15	30N	47E	23-Sep-2003	1
Hondo, 1, 3, 5, 7, 9, 11, 13, 15, 18, 20, 22, 24, 26, 28, 30, 32, 157, 158	24	30N	47E	20-Sep-2003	18
Deb 1, 3, 5	34	30N	47E	22-Sep-2003	3
Revenge 1, 11, 13, 15, 17, 19, 21, 23, 25, 27	34	30N	47E	22-Sep-2003	10
Revenge 3, 5, 7, 9, 29, 30, 31	34	30N	47E	23-Sep-2003	7
FC 1-16, 18	36	30N	47E	21-Sep-2003	17
FC 17	26, 36	30N	47E	21-Sep-2003	1

[1] Source: Erwin and Thompson Title Report and Supplements 2014.

Claim Name	Section	Township	Range	Location Date	Number of Claims
What If 29 - 37	36	30N	47E	21-Sep-2003	9
FC 38 - 46 [3]	36	30N	47E	21-Sep-2003	9
T 38 - 60	10	30N	47E	5-Oct-2006	23
T 61 - 71	10	30N	47E	6-Oct-2006	11
T 72	2, 10	30N	47E	6-Oct-2003	1
FCXX 1, 2	15, 22	30N	47E	24-Nov-2003	2
FCXX 3- 40	22	30N	47E	24-Nov-2003	38
CH 1 - 18	30	30N	47E	19-Sep-2006	18
Hondo 2, 4, 6, 8, 10, 12, 14, 16, 17, 19, 21, 23, 25, 27, 29, 31, 156	24	30N	47E	4-Oct-2006	17
Hondo 155	24	30N	47E	4-Oct-2006	1
	30		48E		
N 1, 3, 11, 13, 19, 21, 23, 25, 27	32	30N	47E	11-Sep-2006	9
N 5, 7, 9, 15,17, 29, 31	32	30N	47E	12-Sep-2006	7
TL 1, 3, 5, 7, 9, 11, 13, 15, 17	20	30N	47E	13-Sep-2006	9
TL 19, 21, 23, 25, 27, 28, 29, 30, 31	20	30N	47E	14-Sep-2006	9
TWE 1 - 16, 18	28	30N	47E	10-Oct-2006	17
TWE 17	22, 28	30N	47E	10-Oct-2006	1
TWE 19 - 36	28	30N	47E	20-Sep-2006	18
WT 1, 3, 5, 7, 9, 11, 13, 15, 17, 29, 31, 33, 35	2	30N	47E	31-Oct-2006	13
WT 19, 21, 23, 25, 27	2	30N	47E	7-Nov-2006	5
WT 37, 39, 41, 43, 45, 47, 49, 51, 53 - 55	36	31N	47E	1-Nov-2006	11
WT 56 - 72	36	31N	47E	8-Nov-2006	17
Unpatented Mining Claims					484

Notes

1. Amended K17 17-Aug-1992, K 18, K20 14-Aug-1992
2. Amended K22, K 24, K25, K26, K 27 17-Aug-1992
3. Amended map 8/31/2006

Table 4-2 Summary of Fire Creek Project Fee Holdings

APN	Legal Description	Royalty	Acres
Section 9 T30N R47E MDB&M			
007-110-01	NW1/4	N/A	160
007-110-13	E1/2 NE 1/4 NE1/4, SE1/4 NE1/4, SE1/4 SW1/4 NE 1/4	N/A	70
Section 15 T30N R47E MDB&M			
007-140-01	N1/2 NW1/4	N/A	80
007-140-03	SW1/4 NW1/4	N/A	40
007-140-05	SW1/4 NE1/4	N/A	40
007-140-12	SE1/4 SW1/4	N/A	40
007-140-14	Lots 1 & 2	N/A	65.39
007-140-15	SE1/4 NE1/4 SW1/4	N/A	10
007-140-19	S1/2 NW1/4 NE 1/4	N/A	20
007-140-20	N1/2 NW1/4 NE1/4	N/A	20
007-140-21	NW1/4 NE1/4 SW1/4	N/A	10
007-140-22	NE1/4 NE 1/4 SW1/4	N/A	10
007-140-23	SW1/4 NE1/4 SW1/4	N/A	10
007-140-25	NW1/4 NE1/4 NE1/4	N/A	10
Section 23 T30N R47E MDB&M			
007-160-08	N1/2 NE1/4 SE1/4	N/A	20
007-160-09	SE1/4 NE1/4 SE1/4	N/A	10
007-160-16	N1/2 SE1/4 NW1/4	5% NSR	20
007-160-17	N1/2 NW1/4 SW1/4	N/A	20
007-160-18	NW1/4 NW1/4	N/A	40
007-160-19	NE1/4 NW1/4	N/A	40
007-160-20	NE1/4 SW1/4 NW1/4	N/A	10
007-160-21	S1/2 SE1/4 NW1/4	N/A	20
007-160-22	NE1/4 NE/1/4 SW1/4	N/A	10
007-160-25	W1/2 SW1/4 NW1/4, SE1/4 SW1/4 NW1/4	5% NSR	30
007-160-26	NW1/4 NE1/4 SW1/4	N/A	10
007-160-27	NE1/4, SW1/4 SE1/4, SE1/4 NW1/4SE1/4	N/A	20
007-160-28	SW1/4 NE1/4 SE1/4, NW1/4 SE1/4 SE1/4	N/A	20
Section 21 T30N R47E MDB&M			
007-610-01	NW1/4	N/A	160
Section 33 T30N R47E MDB&M			
007-640-06	S1/2 NW1/4	N/A	80
29	Fee Parcels		1095.39

Table 4-3 Summary of Fire Creek Project Leased Fee Holdings

APN	Description	Lessor	Royalty	Expiration	Acres
Section 15 T30N R47E MDB&M					
007-140-04	SE1/4 NW1/4	Third Party Lessor	4% NSR	(2)	40
007-140-06	SE1/4 NE1/4	Third Party Lesso	4% NSR	(2)	40
007-140-10	NE1/4 SE1/4, E1/2 NW1/4 Se1/4	Third Party Lessor	2.5% NSR	(2)	60
007-140-07	N2NW4SW4	Third Party Lesso	3.0%NSR & 0.5% wheelage royalty(1)	31-Jul-33	20
007-140-09	W2NW4SE4	Third Party Lessor	3.0%NSR & 0.5% wheelage royalty(1)	31-Jul-33	20
Section 23 T30N R47E MDB&M					
007-160-04	SW4NE4	Third Party Lessor	3.0%NSR & 0.5% wheelage royalty(1)	31-Jul-33	40
007-160-24	NE4NW4SE4	Third Party Lessor	3.0%NSR & 0.5% wheelage royalty(1)	31-Jul-33	10
Section 19 T30N R48E MDB&M					
007-060-69	Parcel 1 of the Sharp Hospital Map recorded in the Office of the Lander County Recorder in Book 375, Official Records, Page 170	Third Party Lessor	3.0%NSR & 0.5% wheelage royalty(1)	31-Jul-33	9.28
8 Leased Fee Parcels					239.28

Notes:

1. *Wheelage royalty is calculated on mineralization mined from other properties which is transported underground through the leased property.*
2. *The lease agreement remains in full force and effect for so long as any mining operations (as defined in the lease agreement) are being conducted on the relevant property on a continuing basis.*

Klondex makes annual assessment payments as required to maintain its land position according to land manager, Mr. Houston (RPL). Receipts were reviewed by the authors in September 2013, which maintain the claims in good standing through September 2014. The total annual fees payable to the BLM for leasing claims are $67,760. Additionally, Lander County receives claim fees of $5,086. Both fee payments are due annually on September 1st. Claims do not expire unless the fees are not paid. The private lands, leases and options to purchase are subject to differing cash payments and net smelter return royalties (NSR).

Royalties affect ten parcels owned and / or leased by Klondex, as listed in Table 4-2 and Table 4-3. Royalties applicable to the unpatented mining claims are discussed below. Property agreement obligations are listed in Table 4-4.



Table 4-4 Summary of Fire Creek Project Holding Costs

Due Date	Proj #	File #	Commitment/Obligation	$ Oblig	Payable/Due to	Notes
9/1/2005	L1010	2.4-6	3 Leased Parcels [(1)]		Third Party Lessors	1987 Leases extended for 10 years from 9/1/2005
8/19/2013	L1010	2.4-6	Property Taxes - 3 Leased Parcels	$ 146.78	Lander County Treasurer	Lessee to pay property taxes
8/19/2013	L1010	8.3	Property Taxes 29 - Klondex Owned Parcels	$ 1,032.33	Lander County Treasurer	Real Property Taxes Due 3rd Monday of August annually
8/19/2013	L1010	8.3	Property Taxes 2 - Klondex Owned Parcels	$ 84.08	Eureka County Treasurer	Real Property Taxes Due 3rd Monday of August annually
8/31/2013	L1010	10	BLM Claim Fees - 484 Claims	$ 67,760.00	Bureau of Land Manageent	484 Klondex Owned Claims x $140/Claim
9/1/2013	L1010	2.4-6	3 Leased Parcels - Annual AMR Payment	$ 24,000.00	7 Third Party Lessors	Annual AMR payment due on lease anniversary
9/1/2013	L1010	2.4-6	Insurance Certificates		7 Third Party Lessors	Insurance certificates required under terms of leases
11/1/2013	L1010	10	Lander County NOI to hold - 484 Claimes	$ 5,086.00	Lander County Recorder	484 Klondex Owned Claims x $10.50/claim + $4
9/1/2015	L1010	2.4-6	3 Leased Parcels - Expire		7 Third Party Lessors	Leases expire - Renew
			Total	$ 98,109.19		

Notes:

1. *The lease agreement remains in full force and effect for so long as any mining operations (as defined in the lease agreement) are being conducted on the relevant property on a continuing basis.*

Source: Erwin and Thompson Title Report

In addition, pursuant to a mining lease agreement effective July 31, 2013 with respect to five leased fee parcels, Klondex is required to pay minimum rental payments of $50,000 per year for the first ten years of the lease which increase by $10,000 for each subsequent ten year period (including any renewal period). This lease also includes provisions that subject Klondex to an additional increase under certain circumstances. Pursuant to such mining lease, Klondex paid a minimum rental payment of $49,000.

On February 12, 2014, the Company entered into a royalty agreement (the FC Royalty Agreement) with Franco-Nevada US, a subsidiary of FNC, and KGS, pursuant to which KGS raised proceeds of US$1,018,050 from the grant to Franco-Nevada US of a 2.5% NSR royalty for Fire Creek. The royalty applies to all production from Fire Creek beginning in 2019.

KGS entered into a gold supply agreement with Waterton Global Value, L.P. (Waterton) dated March 31, 2011, as amended and restated October 4, 2011 (the Gold Supply Agreement). Pursuant to the Gold Supply Agreement, the Company granted Waterton the right to purchase refined bullion (as defined in the Gold Supply Agreement) produced from Fire Creek for the period commencing February 28, 2013 and ending February 28, 2018, subject to adjustment (the Term). If the Company has not delivered an aggregate minimum of 150,000 ounces of refined bullion during the first four years prior to the end of the Term, the Term will be extended until an

aggregate of 185,000 ounces of refined bullion has been delivered (including any refined bullion delivered during the original Term) to Waterton. Under the Gold Supply Agreement, in the event that Waterton exercised its right to purchase refined bullion during the period of February 28, 2013 to May 31, 2013, the purchase price per ounce payable by Waterton was to be the purchase price per ounce of the last settlement price of gold on the London Bullion Market Association (the LMBA) PM Fix on the last trading day prior to the date Waterton provides notice to the Company that it intended to exercise its purchase right (the Pricing Date) less a 1% discount (which discount is only applicable if such price is more than US$900 per ounce). In the event that Waterton exercises its right to purchase refined bullion during the period following May 31, 2013 and before February 28, 2016, the purchase price per ounce payable by Waterton is the average settlement price of gold on the LMBA PM Fix for the 30 trading days immediately preceding the applicable Pricing Date (the Average Price) less a 1% discount; provided that in each case, if such price per ounce is less than US$900 the discount will be nil. In addition, in the event that Waterton exercises its right to purchase refined bullion after February 28, 2016, the purchase price per ounce will be the Average Price immediately preceding the applicable Pricing Date, without any discount.

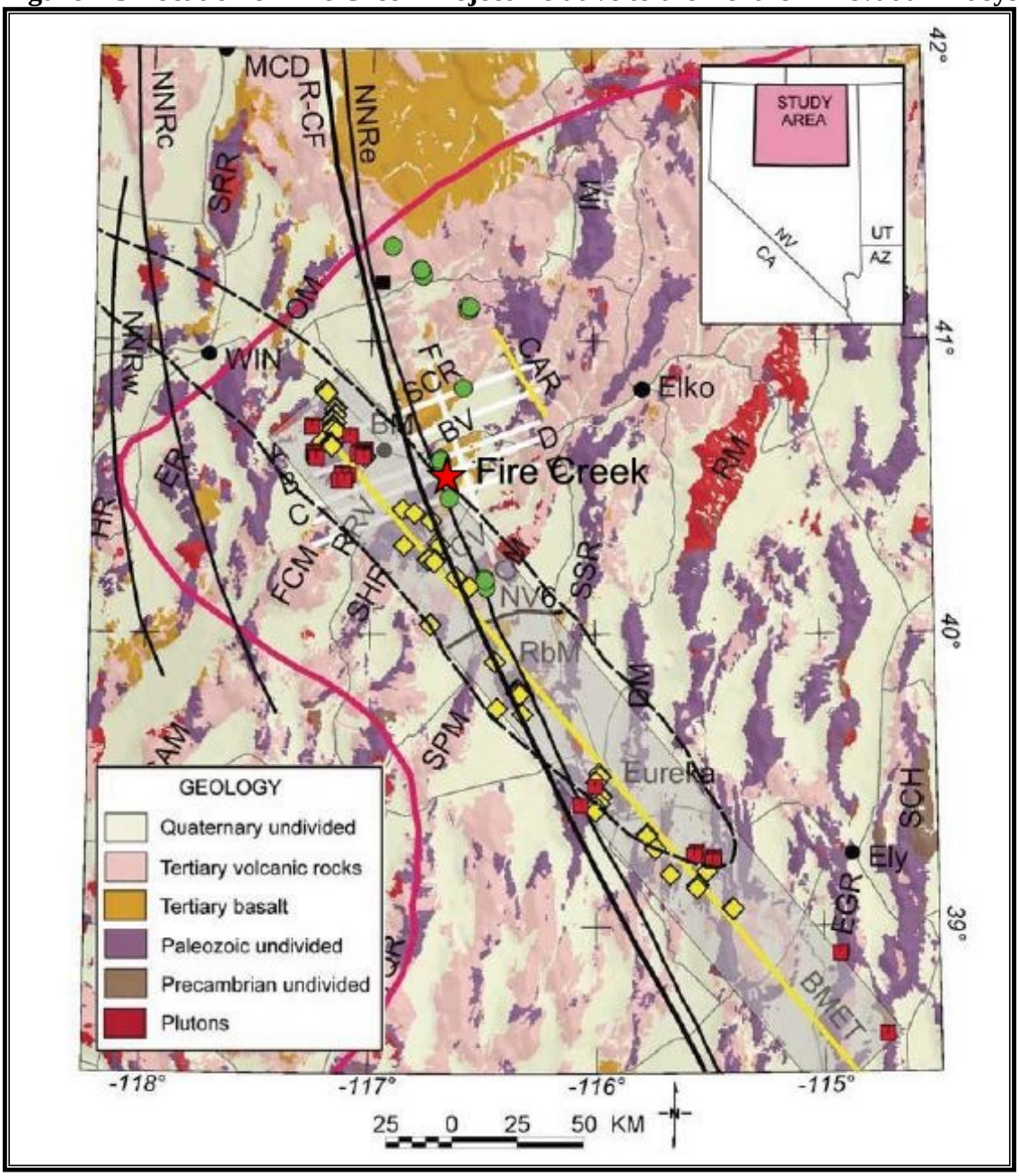
The claim locations are based on location of monuments and their dimensions cited to the BLM thereof. The claims' boundaries are not surveyed, and the boundaries' exact locations depend on physical positions of the location posts in the field. The authors are not aware of any conflicting surface rights in this area or near Fire Creek. Other considerations that might affect accessing claim status include grazing rights and protected habitats. Grazing rights may exist in the area and conflicts with local ranchers are not common in this region. Newly established protected habitat for sage grouse has not been defined in this area at the time of this Technical Report. There are archaeological considerations in the immediate area of Fire Creek; however, all new surface disturbance proposed by Klondex is reviewed and permitted by the BLM prior to construction. Land information regarding claim status and fee lands was provided by Klondex, and to the authors' knowledge at the time this document was authored, there were no environmental or social factors that would affect land title.

4.4 Location of Mineralization

The Fire Creek gold mineralization transpires in steeply dipping epithermal veins within Tertiary basalt flows and intrusive rocks. The mineralized basalt rocks at Fire Creek are a unique suite of mafic-intrusive rocks characteristic of a regional northwest-trending structural zone. The NNR system, which is useful in understanding the timing and structural control of the mineralization, has been documented in multiple geophysical studies (Ponce, D.A. et al., 2008 and Watt, J.T. et al., 2007) and is distinguished as a narrow, linear magnetic anomaly 30 miles wide that extends

190 miles south to south east from the Oregon-Nevada border to central Nevada. The rift emanates from the McDermitt Caldera in northwest Nevada and is likely related to the migrating Yellowstone hot-spot (Zoback, et al., 1994). Figure 4-3 shows the location of Fire Creek relative to the NNR.

Figure 4-3 Location of Fire Creek Project Relative to the Northern Nevada Rift system



Modified from Ponce et al., 2008.

Klondex has an approved plan of operations with the BLM covering its current exploration activities and an approved bulk sampling permit from the State of Nevada for the Project. The

permits required to conduct the work proposed by Klondex are listed in Table 4-5. There are no environmental permitting issues known to the authors related to the proposed work at Fire Creek.

Table 4-5 Fire Creek Project Significant Permits

Permit	Permit Number	Agency	Permit Type and Explanation
Environmental Assessment and Plan of Operations	NVN-079769	BLM	Plan of Operations is required for all mining and processing activities and exploration exceeding 5 acres of disturbance. BLM approves plan and determines the required environmental studies, usually an environmental assessment or an environmental impact study based on the requirements outline in the National Environmental Policy Act.
Record of Decision		BLM	A Record of Decision (ROD) in the United States is the formal decision document which is recorded for the public.
Water Pollution Control Permit (Operations)	NEV2007104	NDEP, BMRR	Mines operating in the State of Nevada are generally required to meet a zero discharge performance standard. A WPCP is required for the extraction of ore. A separate permit may be issued for certain activities at a specific facility, such as rapid infiltration.
Water Pollution Control Permit (Infiltration)	NEV2013102	NDEP, BMRR	Water Pollution Control Permit for infiltration of water from the underground mine operations. This permit is still in the approval process.
Water Rights	28637, 77002, 77003, 75129	NDWR	Water rights are issued by the Nevada Division of Water Resources based on Nevada water law which issues permits based on prior appropriation and beneficial use. Prior appropriation (also known as "first in time, first in right") allows for the orderly use of the state's water resources by granting priority to senior water rights. This concept ensures the senior uses are protected, even as new uses for water are allocated.

5 Accessibility, Climate, Vegetation, Physiography, Local Resources, and Infrastructure

5.1 Access to Fire Creek Project

Fire Creek is easily reached from the town of Elko by driving west on Highway I-80 for 40 miles to the Beowawe and Crescent Valley Exit #261. From Exit #261, proceed south on Nevada State Highway 306 for 16 miles (passing through Beowawe) to 10th Street (there is a sign on the right). On 10th Street, there is a Company sign at the turn that indicates, "Klondex Gold & Silver Mines, Limited". 10th Street is the mine access road. Fire Creek is located six miles west on 10th Street, in Lander County, Nevada.

The state and county roads leading to the mine are mostly paved and maintained in order to service the ranches and mines in Crescent Valley such as Barrick Gold's Cortez Mine. In this part of Nevada, it is common practice for mine staff to commute long distances for work on a daily basis. The average commute for Klondex staff is one hour each way.

5.2 Climate

The climate at Fire Creek is typical for northern Nevada with hot summers and cold winters. Average daily summer temperatures range from 80° Fahrenheit (°F) to 90°F, and average winter low temperatures range from the low 40s°F to 20°F. Summer temperature extremes may reach 100°F for short periods, and winter extreme temperatures may drop to 0°F for short periods. Fieldwork, including exploration drilling, is commonly conducted throughout the year in this area. Mines in the Crescent Valley typically operate all year without experiencing any major weather-related problems.

5.3 Vegetation

Fire Creek vegetation is mainly limited to sagebrush, other species of low vegetation, and some grasses. There are no trees at the Project. Due to the low amount of rainfall, the vegetation is low and sparse. There is a small marsh associated with the Fire Creek drainage, which provides some wetland vegetation.

5.4 Physiography

Fire Creek lies in elevation between 4,900 feet and 7,200 feet. The United States Geological Survey (USGS) published a base-relief map, which covers the Project area titled, "Mud Springs 7.5' USGS quadrangle". The topographic relief is moderate with mature topography consisting mostly of rounded hills with steeper grades along more competent strata. All stream flows

downstream of Fire Creek are ephemeral, and there are up-gradient springs that source Fire Creek year-round at the Project.

5.5 Local Resources and Infrastructure

The nearest rail siding is located in the town of Beowawe, a small community of about 50 people, approximately 15 miles north of Fire Creek. Crescent Valley, a small town with a population of approximately 200 people, is about seven miles south of Fire Creek.

The towns of Battle Mountain and Elko, about 52 miles northwest and 63 miles northeast of the Project, respectively, are the nearest larger towns and supply most of the labor force. These towns are the only locations with amenities and services such as motels, fuel, grocery stores, and restaurants. The nearest commercial retail stores for fuel and groceries are located in Battle Mountain, 52 miles to the northwest.

Klondex's land holdings at Fire Creek have adequate acreage to support future exploration and mining activities. Fire Creek mineralization will be transported off site to the Company's Midas Mill for processing.

Electrical power is provided to Fire Creek by NV Energy, Inc. ("NV Energy") via a transmission line and substation located near the eastern Project boundary. The substation was connected to the NV Energy electrical grid in 2013.

6 History

6.1 Exploration History

Prior to 1967, local prospectors performed primitive exploratory investigative work on the Project, which was not documented. Table 6-1 below, itemizes exploration performed since 1967:

Table 6-1 Exploration History

Dates	Company	Details
1967	Union Pacific Resources	Drilled two core holes
1974 to 1975	Placer Development Ltd.	Drilled 22
1975	Klondex Mines Ltd.	Acquired the property.
1984	Minex Resources, Inc.	Leased the property from Klondex.
1986 to 1987	Alma American Mining Company ("Alma")	Alma leased the property.
1988	Aurenco Joint Venture ("AurencoJV")	Aurenco JV formed between Black Beauty Mining and Covenanter Mining.
1988 to 1990	Aurenco JV	Leased the property from Klondex.
1990 to 1995	Klondex Mines Ltd.	No activity.
1995 to 1996	North Mining Inc. ("North Mining")	North Mining leased the property from Klondex.
1996 to 2004	Klondex Mines Ltd.	No activity.
2004 to 2012	Klondex Mines Ltd.	Began a deep exploration program.
2012 to Present	Klondex Mines Ltd.	New Management and Board of Directors.

In summary, from 1967 to 1994, exploration focused on near-surface oxide mineralization most likely for bulk-mineable targets. Klondex acquired Fire Creek in 1975. As a result of that exploration, a joint venture, called Aurenco JV, was formed between Black Beauty Mining and Covenanter Mining. Aurenco JV mined a limited amount of material from a pit and constructed a small test heap leach operation under lease from Klondex in the late 1980s. Approximately 1,000 ounces of gold were recovered from the heap leach, according to Klondex's 1987-1988 annual brochure.

From 1988 to 1990, the Aurenco JV completed 51,476 feet of rotary drilling, 500 soil samples, and 750 surface rock chip samples. Material mined during the Aurenco JV was from the siliceous cap, which overlies the deeper, epithermal vein system reviewed in this Technical Report. Mining the siliceous cap did not prove to be economical due to erratic gold grades and high clay content, which impeded the heap leaching process.

In 1995 and 1996, North Mining leased the property from Klondex and commenced the first technical exploration drilling program to examine deeper targets. North Mining drilled 67 rotary

and core holes for a total of 39,570 feet. This program successfully drilled the first high-grade gold intercept at depth at Fire Creek. In 1995, North Mining conducted an IP-Resistivity survey along ten east-west lines. Much of North Mining's drill locations in 1995 and 1996 targeted results from these geophysical tests; however, the wide point and line spacing did not detect the narrow vein anomalies. Details of this earlier geophysical survey were itemized in the Fritz Geophysics report for Klondex (Fritz, 2006) and in an unpublished report for North Mining (Edmondo, 1996). It was not until 2004 that Klondex began systematically drilling deeper targets to define the potential of this mineralization.

In 2004, Klondex based its initial drilling targets on the results of North Mining's drilling program carried out from 1995 to 1996 in combination with the following information: analysis of more sophisticated detection techniques, such as intersections of structures and alteration observed in mapping; analysis of surface geochemistry and airborne helicopter electromagnetic (HEM) surveys; and on interpretation of IP responses from their dipole-dipole survey. Klondex focused its exploration on drilling for mineralization occurring within the Main and West zones penetrating depths ranging from approximately 500 to 1,700 feet. The results of this drilling intercepted positive grades from 0.15 opt to 1.0 opt.

Klondex conducted another IP survey in 2004, using closer line spacing and dipole points, identified clay alteration zones that trend north-northwest, coincident with the general strike of veins intersected by subsequent Klondex drilling and coincident with the general trend of NNR faults (see Regional Geology, Section 7.1 of this report). At least two offsets of the trends are interpreted as cross faults. From 2004 to 2010, Klondex drilled 231 surface holes with a total footage of 297,586 feet.

6.2 Production History

Historic production, as itemized previously (Raven et al., 2011), is limited to marginal mining of oxidized siliceous cap material from a pit and construction a small test heap leach operation from 1988 to 1990. A summary of the Raven report follows:

> *"In the early 1980's a joint venture with Aurenco/Black Beauty Coal mined a small amount of material from a pit and constructed a small test heap leach operation. This work focused on the siliceous cap material that overlies the deeper, epithermal vein systems; mining of the siliceous cap did not prove to be economic as the grades were too erratic and high clay content hampered the heap leaching." (Page 11)*

With the exceptions of current operations, there has been no other historic production at Fire Creek since 1990.

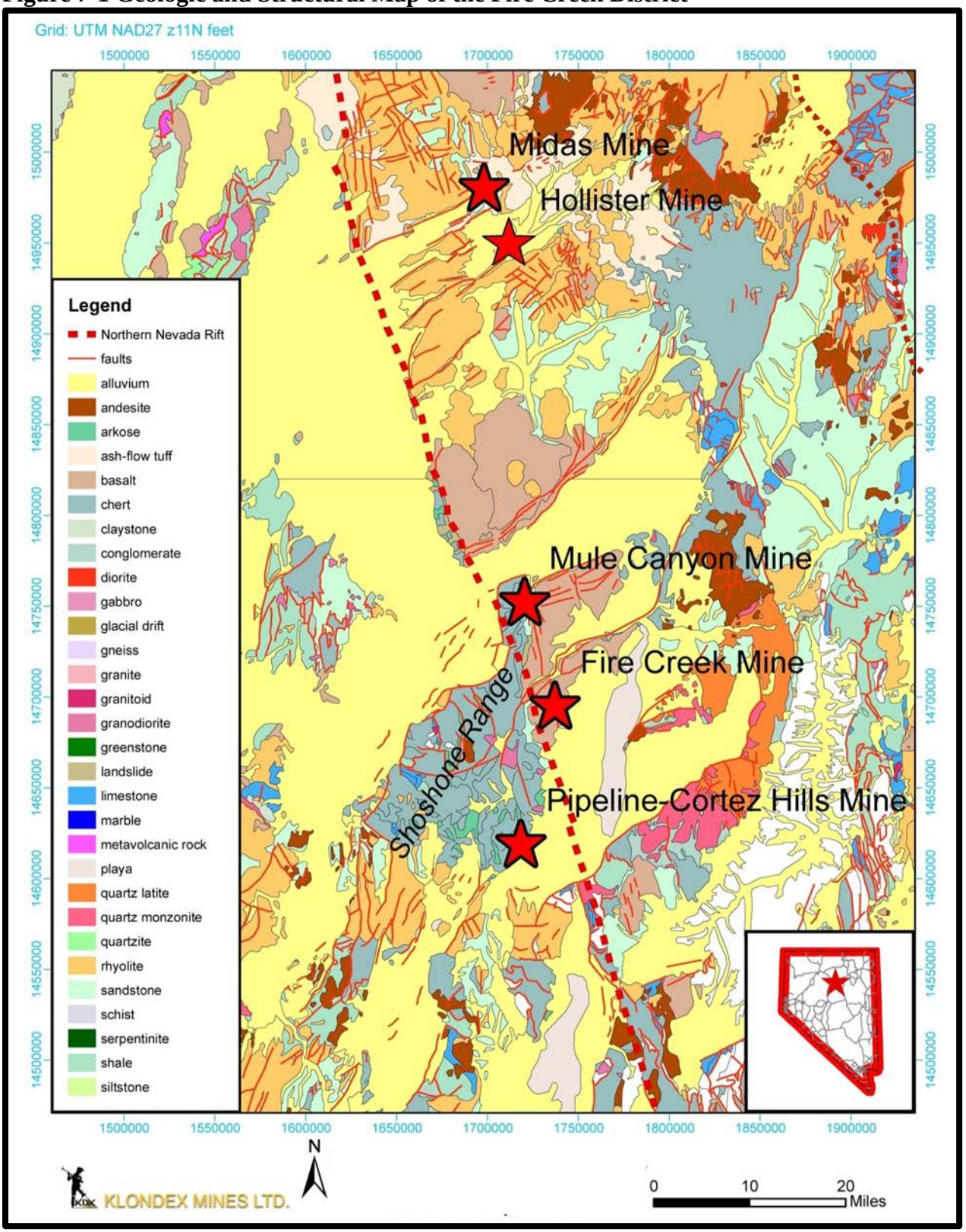


7 Geological Setting and Mineralization

7.1 Regional Geology

Fire Creek is located in the northeast flank of the Shoshone Range within the structural domain of the NNR. The domain contains structures that are associated with regional wide epithermal-type gold veins, such as those that occur at the Company's Midas Project (Midas) also known as the Ken Snyder Mine, Newmont Mining Corporation's (NMC) Mule Canyon Mine (Mule Canyon), and Waterton Global Mining Company, LLC's Hollister Mine, are all within the NNR structural domain, (Figure 7-1). Barrick Gold Corporation's (Barrick) Pipeline-Cortez Hills deposits are to the west of this structural domain and do not share similar structural characteristics with Fire Creek. Information regarding each of the above-mentioned properties is not necessarily indicative of the mineralization of the Fire Creek Project.

Figure 7-1 Geologic and Structural Map of the Fire Creek District

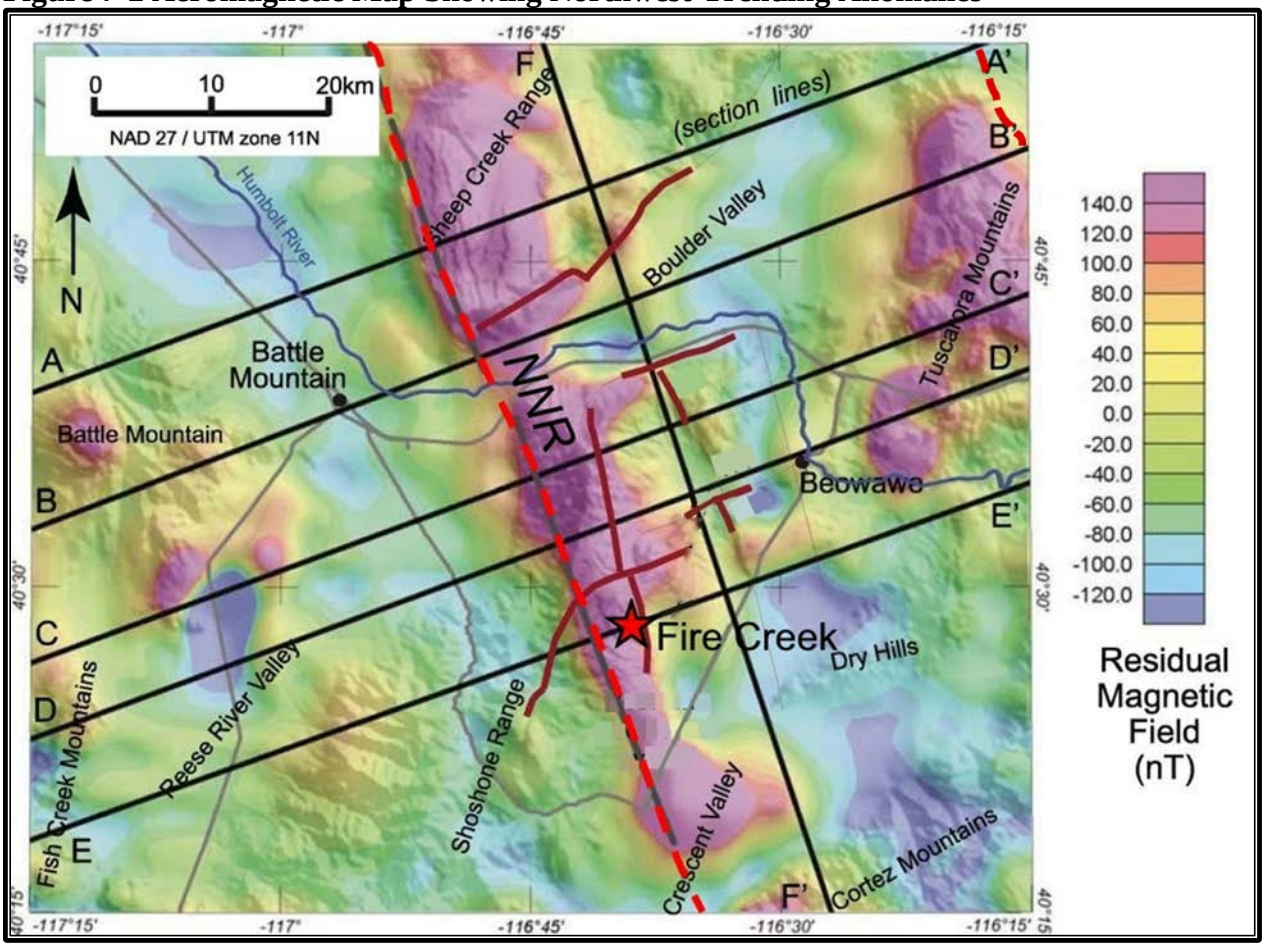


Modified from Ludington et al., 2005.

The NNR structural domain is distinguishable on regional scale magnetic maps as a prominent north-north west (NNW) trending magnetic high. This distinctive magnetic signature is caused by detection of a series of Miocene-age syn-rift volcanic and hypabyssal rocks that range in composition from dacite to basalt.

The rift is thought to originate at the McDermitt Caldera in northwest Nevada and is related to the initial eruption of the Yellowstone hot-spot (Zobak, et al., 1994). The NNR is bounded on the west by north-west trending regional lateral faults. Along strike of these faults are a series of intersecting sub-parallel, northeast-trending, high-angle normal faults that bound and offset the Shoshone Range near Fire Creek. In the northern portion of the NNR Middle Miocene, (approximately 13.8 to 16.3 Megaannum [Ma]) aged basalt, basaltic andesite, and rhyolite flows and dikes intrude the basement rocks. These are the rocks that host mineralization at Fire Creek. These features are visible in aeromagnetic anomaly maps and sections from Watt et al., 2007 (Figure 7-2 and Figure 7-3).

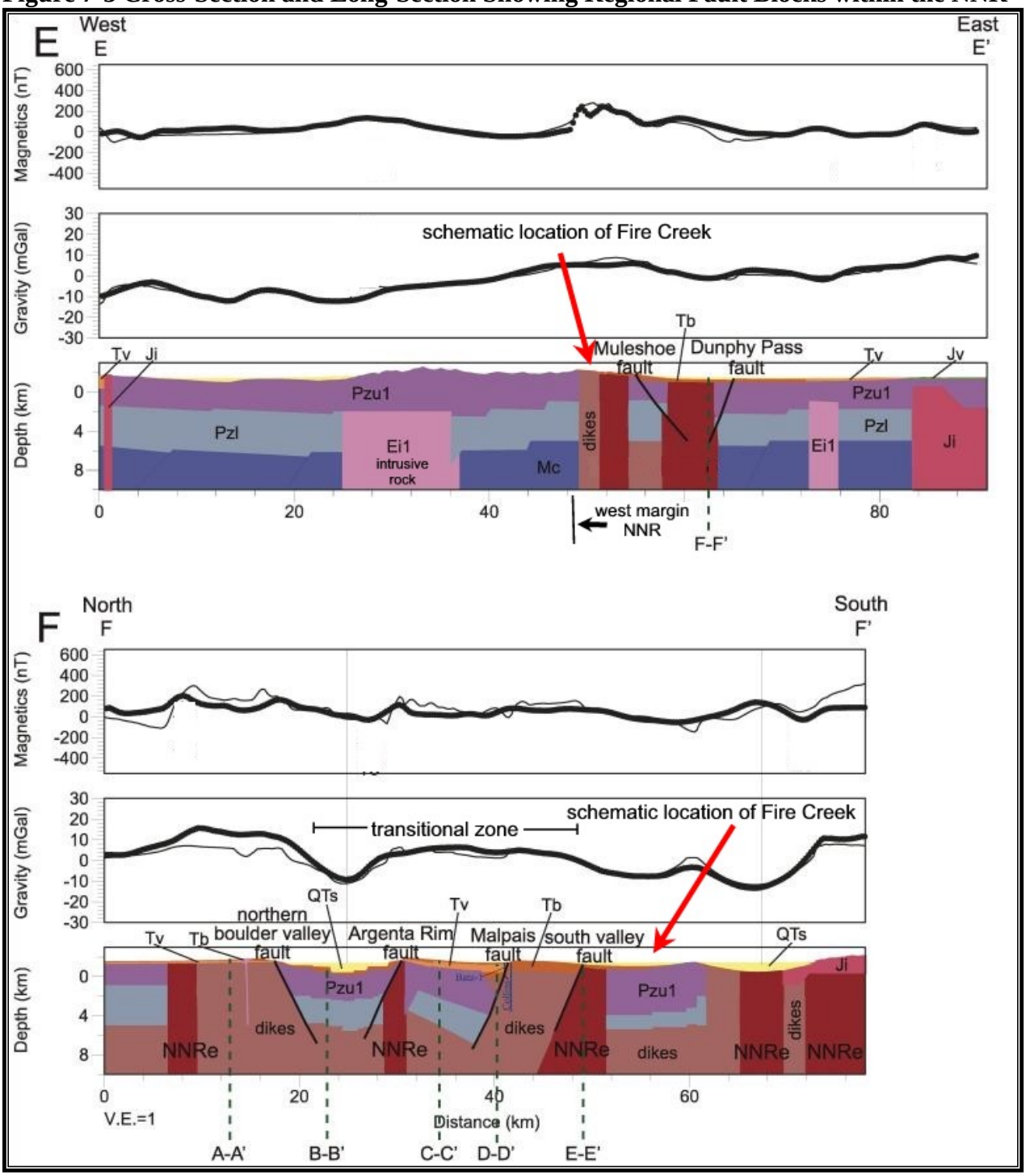
Figure 7-2 Aeromagnetic Map Showing Northwest-Trending Anomalies



Modified from Watt et al., 2007.

The overall orientation of down-dropped basement blocks within the NNR domain infers a rift-setting with tensional, pull-apart deformation along predominantly north-northwest fault orientations. Basement blocks are down-dropped to the south in the northern portion of the domain and down-dropped to the north in the southern portion of the domain in this vicinity. The Fire Creek deposit is located near the southern extents of this transitional zone within the NNR, (Figure 7-2 modified from Watt et al., 2007). Faults occur in both northwest and northeast orientations. A cross-section and long-section showing magnetism and structure are shown in Figure 7-3.

Figure 7-3 Cross-Section and Long-Section Showing Regional Fault Blocks within the NNR



Modified from Watt et al., 2007.

The chemical composition of the volcanic and intrusive rocks varies greatly within the rift zone throughout its length. Mineralization development was contemporaneous with mid-Miocene

volcanism. Volcanism continued into the late Miocene era frequently capping the mineralization with a thick and barren sequence of volcanic rocks.

Rift-hosted gold deposits are typically epithermal in origin and structurally controlled. Epithermal systems are host to high-grade, near vertical veins with varying ratios of gold to silver. Gold mineralization at Fire Creek is epithermal in origin and is structurally controlled by faults.

The significance of regional intrusive centers to mineralization in the NNR is not well understood. Intrusive stocks that are found near to Fire Creek are associated with Carlin-Type gold mineralization and are older (30 – 40 Ma) than the NNR host rocks; therefore, these stocks are not believed to be important in the development of NNR epithermal systems. Mafic rocks, however, within the NNR may or may not be related to the hydrothermal mineralization. Most of the intrusions associated with mineralization at Mule Canyon, where dike contacts are key indicators for locating mineralization, are mafic in composition, but not all the mafic intrusive rocks in the NNR are mineralized. The majority of the mafic volcanic rocks in the NNR occur from between the Sheep Creek Range north of Highway I-80 to south of Fire Creek. Mafic volcanic rocks are a minor component at Hollister and less evident at Midas. The southeastern-most basalt flows occur at Buckhorn. Mafic intrusive rocks within the NNR also occur as sheeted dikes as far south as the Roberts Mountains.

The vein and alteration mineralogy observed at Fire Creek and Mule Canyon are related to the mafic host rocks. Intrusive mafic rocks associated with gold mineralization were intersected by drilling at Fire Creek. Eruptive centers on the western margin of the NNR produced a widespread sequence of mostly mafic to intermediate volcanic rocks observed at Fire Creek. NNW striking normal faults are the main controlling structures for mineralization at Fire Creek, which are observed on a regional scale in the northern part of the NNR.

7.2 Fire Creek Project Local Geology

Volcanic stratigraphy near Fire Creek consists of a series of Miocene basalt, andesite and dacite flows, tuffs, and pyroclastic rocks. These overlie Paleozoic clastic sediments. At the Project, most of the units have been given alphanumeric designations rather than formal names. Felsic tuffs have been observed at Fire Creek, but felsic dikes have not been observed.

There are no known outcrops of intrusive rocks at Fire Creek; however, drilling intersected abundant mafic basalt and gabbro dikes that intrude most of the basalt flows. The basalt dikes commonly have brecciation textures along their margins that are strongly argillicly and propyliticly altered.

Within the Project area, Miocene volcanic rocks are approximately 1,500 feet thick and consist of the following units from youngest to oldest:

Tb, Tlat: upper sequence of basalt flows and lapilli-lithic tuff;

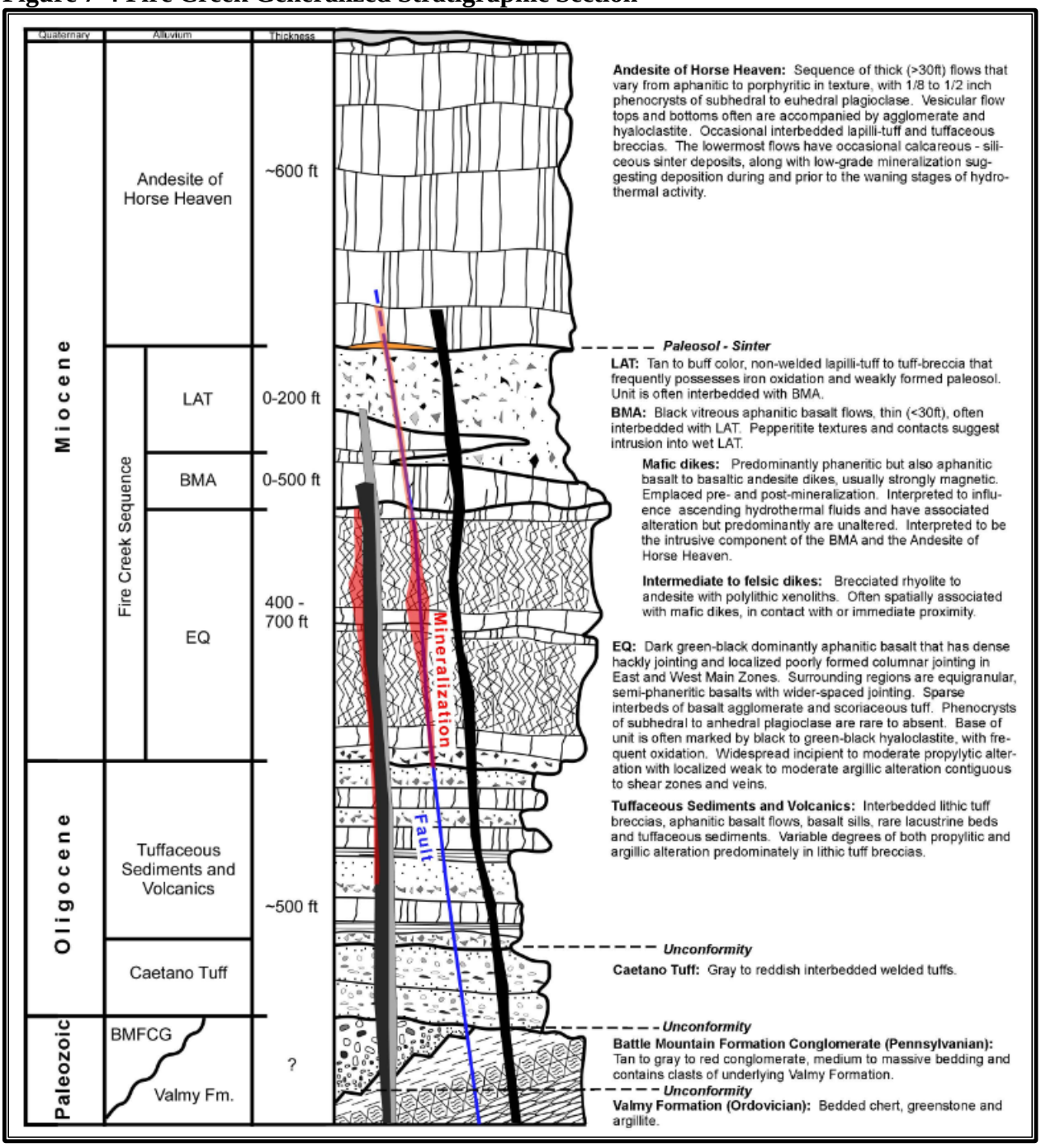
Tbm,Tbeq: middle sequence of equigranular basalt;

Massive basaltic-andesite and andesite flows with interbedded mafic tuffs and a palagonite-rich (altered basaltic glass) basalt equigranular hyaloclastite breccia of Tbeq; and

Tbt: lower sequence of two (possibly three) lapilli plus or minus lithic tuffs with a thin, interbedded basaltic-andesite to andesite flow, and organic-rich lacustrine horizon (Ttb).

This stratigraphic sequence overlies an unconformable contact with crystal-rich rhyolite ash-flow tuff inferred to be the Eocene Tuff of Cove Mine (Tcm) or Centano Tuff based on regional distribution, appearance, and phenocryst assemblage. Thickness of this lower Eocene unit ranges from absent to greater than 300 feet in the northeast section of Fire Creek, which could infer its deposition and preservation in an Eocene paleo-drainage, as documented at Mule Canyon (John et al., 2003). Beneath this ash-flow tuff is a thin conglomerate horizon composed dominantly of Paleozoic basement rocks marks the Tertiary unconformity. Basement rocks consist of complexly deformed silici-clastic sedimentary rocks, which include argillite, siltstone, and quartzite attributed to the Ordovician Valmy Formation.

Figure 7-4 Fire Creek Generalized Stratigraphic Section



(internal Klondex document, 2014)

The structural character of the Fire Creek deposit is consistent with extensional deformation within the NNR domain. Steep normal faults that strike in the range of N10 °W to N30 °W form horst and graben blocks that host and offset the deposit. Steeply dipping NNW striking faults and dike contacts provide structural control of the gold mineralizing solutions. Basin and Range normal fault movement resulted in minor eastward rotation of the Fire Creek volcanic sequence.

At Fire Creek, the mineralization does not occur at the surface in the remnant of the opaline silica cap, which was deposited above the deeper mineralization. The cap rocks are barren of gold, but gold occurred in nearby faults and was the object of early prospecting and later shallow drilling through the 1980s.

8 Deposit Types

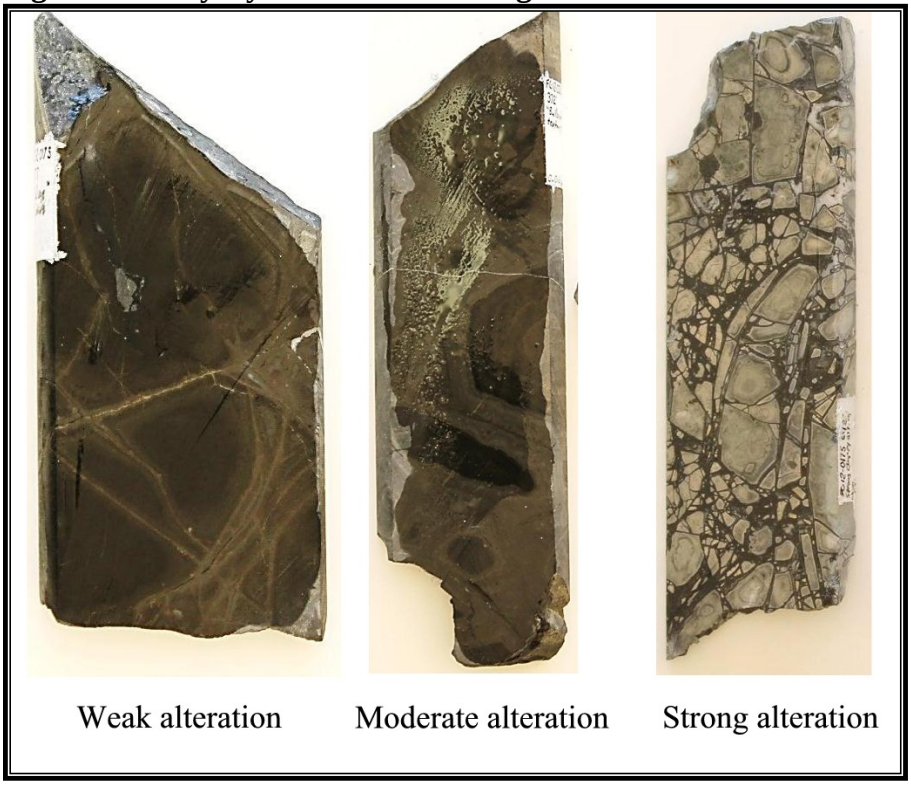
8.1 Alteration and Mineralization

Analysis and definition of the style of mineralization encountered at Fire Creek is ongoing and being further developed. Details of the deposit were previously described in Raven et al., 2011. Current observations augmenting Raven's previous descriptions are described below.

The hydrothermal system being explored at Fire Creek is currently interpreted as a low sulfidation, epithermal precious metal vein system. Mineralization at Fire Creek extends from a siliceous sinter on the surface downward to a high-grade zone. Contacts, faults, and fractures likely provided conduits for fluids to migrate to the surface and vent as a hydrothermal hot spring sinter. As the hydrothermal fluids cooled, siliceous minerals precipitated and formed the cap. Later oxidation of the upper part of this hydrothermal system likely occurred due to convection of a localized plume of low pH groundwater. This oxidation effect altered the host rocks under the silica cap to an assemblage of clays, zeolites, and iron oxides.

In 2012, development drifting exposed the alteration assemblage envelope and two major mineralized veins, the Joyce Vein and the Vonnie Vein. The mafic composition of the basalt and andesitic volcanic wall rock is the main mechanism for the alteration assemblage. Wall rock alteration at Fire Creek is dominated by montmorillonite clay and pyrite. Quantity and intensity of alteration follows a progression from weak-pervasive chlorite through an increase in bleaching and clay-to-pyrite breccia matrix, with concentrically rimmed and bleached breccia clasts. This alteration suite intensifies to a strongly bleached breccia with dark pyrite-silica-clay matrix (Figure 8-1).

Figure 8-1 Clay-Pyrite Alteration Progression from Weak to Strong (left to right)



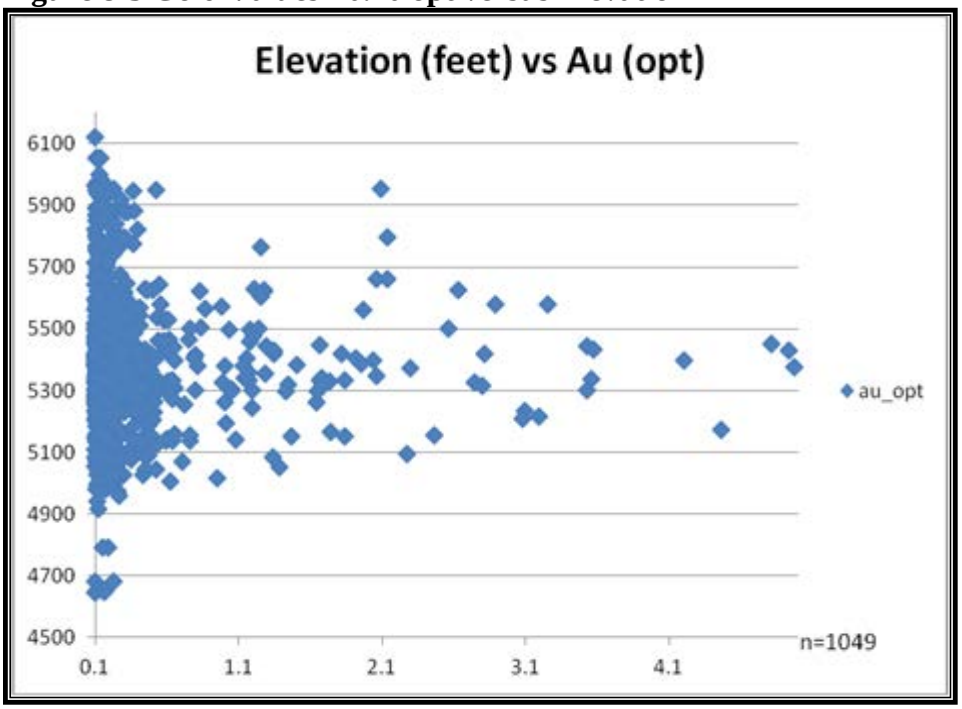
The hydrothermal breccias observed in the wall rocks at Fire Creek do not show open space vugs with clast rotation, which would infer an environment typical of violent brecciation due to emplacement of boiling solutions or tectonic movement. Rather, the brecciated clasts in the wall rock are altered in place, and the process of brecciation is interpreted to be passive or chemically-derived. Clay-to-pyrite alteration at Fire Creek typically is more pervasive in volume than veining and may or may not be associated with gold mineralization. Calcite and quartz-calcite veins commonly cross-cut the clay-to-pyrite alteration of wall rock at Fire Creek. This observation suggests the clay-to-pyrite alteration preceded the vein development. The degree and volume of alteration infers a prolonged wall rock-to-fluid chemical interaction. Sharp halos of clay-to-pyrite alteration on the margins of the main veins suggest chemical brecciation in the wall rock developed prior to vein emplacement, and then the wall rock proximal to the vein was subjected to a shorter exposure of fluid-interaction at the time of veining. Brecciation texture adjacent to a veinlet is shown in Figure 8-2.

Figure 8-2 Brecciation Texture Adjacent to a Veinlet



The highest gold grades, above 0.5 opt, occur between the 5,300 feet and 5,500 feet elevations indicating this was a significant horizon for gold deposition. Grades below this cut-off occur above and below this horizon. If vein emplacement at Fire Creek was related to the boiling horizon, then fluids that created the veins would likely have been emplaced rapidly in an explosive environment. A preferential boiling horizon is supported by comparing gold values with elevation in the following diagram.

Figure 8-3 Gold Values >0.10 opt versus Elevation



Vein mineralogy varies from vein to vein. The western Joyce Vein is dominated by coarse bladed calcite and less silica (approximately 60 to 70% calcium-carbonate [$CaCO_3$]), and the

main Joyce Vein is dominated by banded chalcedony with less carbonate. Silica in Fire Creek mineralization is generally low because the wall rocks are low in silica (51%). Pyrite was likely formed during alteration of iron rich minerals in the basalt (pyroxene) by sulfur-enriched hydrothermal solutions and then deposited as pyrite on the original magnetite in the host rock. Vein widths at Fire Creek range from less than one foot to about five feet wide. Widths appear wider when they intersect drifts or drill holes other than at right angles. True vein widths average three feet wide and are less massive than the multi-foot vein widths observed at Midas.

Coarse visible gold mineralization with high grades occurs in both the Joyce Vein and the Vonnie Vein. The Vonnie Vein is consistently higher grade with a general lack of calcite and in strong correlation with banded chalcedony (Figure 8-4). The Joyce Vein is consistent with gold grades approximately 1.0 to 5.0 opt for longer traces of gold mineralization. The Joyce Vein commonly has large vugs. The Vonnie Vein commonly has large vugs and exhibits supergene oxidation that characteristically stains the vein reddish brown in color. Vein mineralogy in detail is yet unknown. Earlier petrography conducted for Klondex by Mr. Larry Larson indicates the presence of adularia with electrum in the veins. Specimens with visible gold mineralization are shown in Figure 8-4 and Figure 8-5.

Figure 8-4 Coarse visible gold mineralization (VG) in a massive, epithermal quartz vein

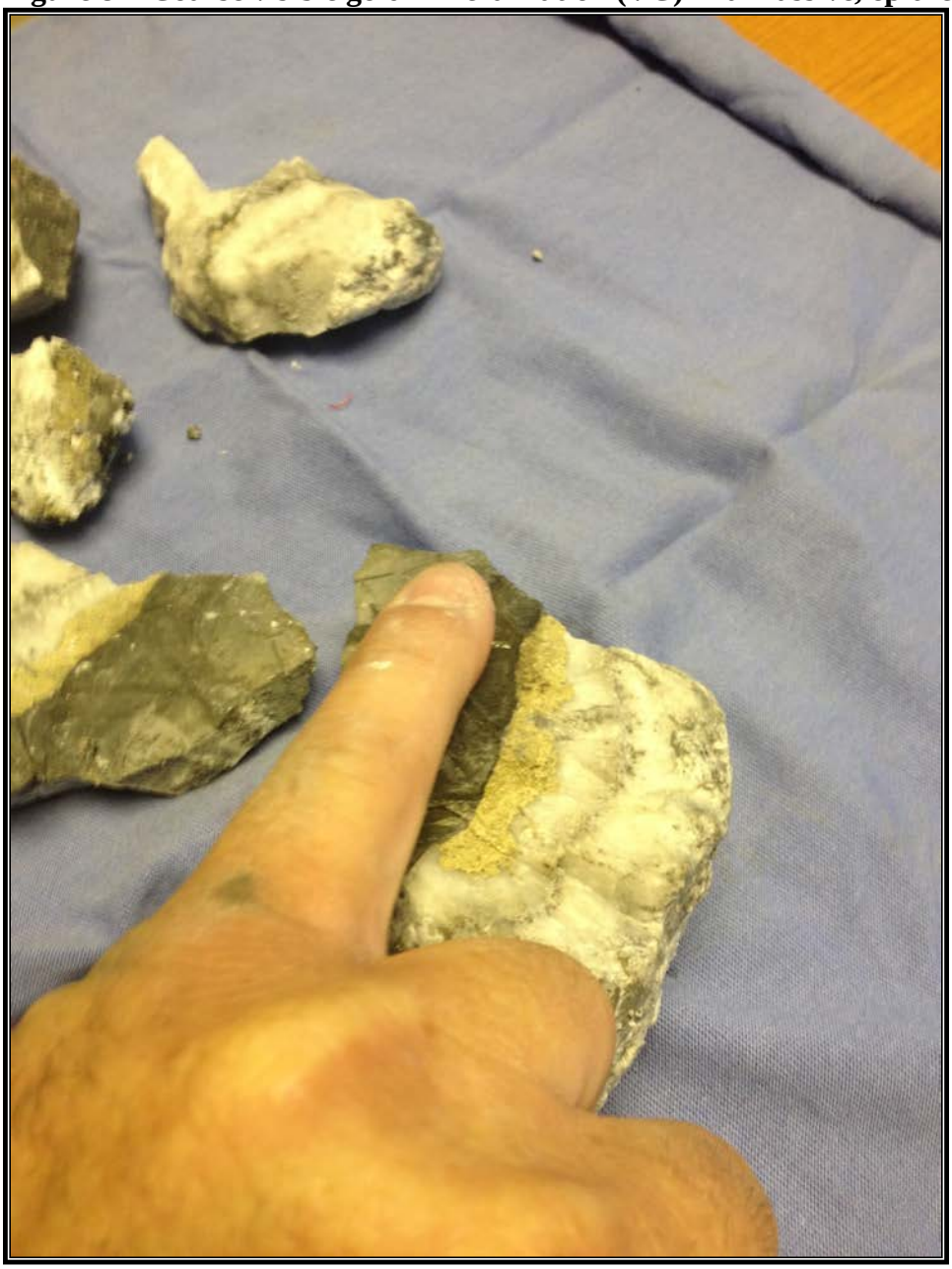


Figure 8-5 Clots of visible gold mineralization (VG) in veinlet within altered brecciated basalt (January 2013)



The most substantial gold and silver mineralization defined to date at Fire Creek is hosted by the Joyce Vein and Vonnie Vein (Figure 8-6). Additionally, 30 other veins have been identified by surface and underground drilling and underground development. The veins strike from north-south to N40W. The Joyce Vein has been developed over a strike length of approximately 1,000 feet and an additional 2,000 feet remains undeveloped. The Vonnie Vein has a developed length of 370 feet and an additional undeveloped length of 960 feet. Both the Joyce Vein and Vonnie Vein have possible vertical extents of mineralization from 200 to 300 feet below the 5370 to

5400 working levels and 200 to 400 feet above those levels based on surface and underground drill results. Both the up-dip and down-dip extensions are inadequately explored.

The location of the Joyce Vein and Vonnie Vein with asbuilts is shown in Figure 8-6. A photo of the Joyce Vein is shown in Figure 8-7.

Figure 8-6 Joyce Vein and Vonnie Vein with Asbuilts (Klondex, 2013)

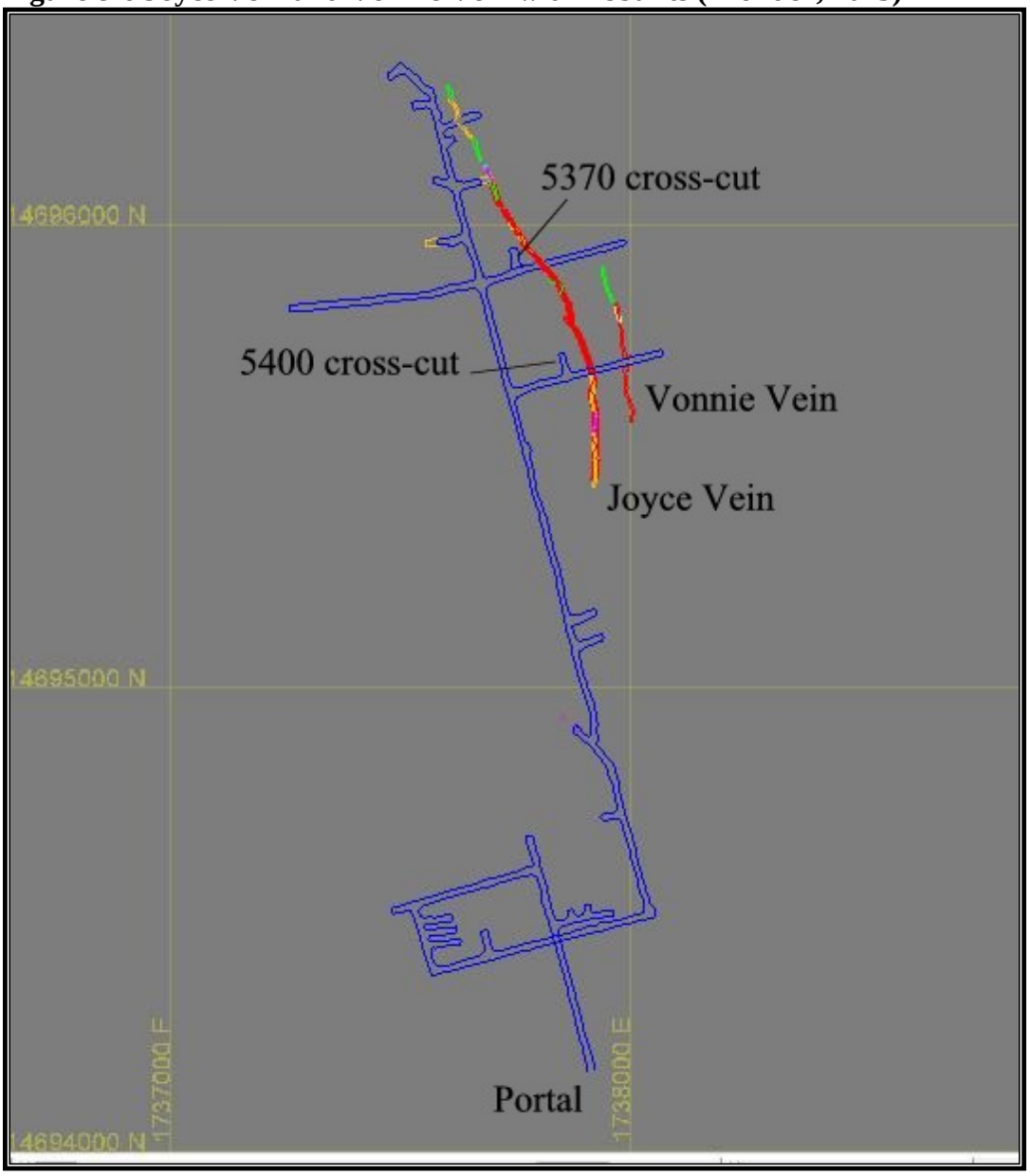


Figure 8-7 Photograph of the Joyce Vein looking North from the 5370 Cross-Cut (Klondex, 2013)



Additional mineralization has been identified in the brecciated basalts immediately adjacent to the quartz-calcite veins, but the extent of the mineralized breccia is not well-known and is not included in the mineral resource estimate.

The following points summarize alteration and mineralization:

The silica cap may not lie directly above the gold mineralization; it is only the surface expression of where the hydrothermal fluids erupted on the surface.

A review of the silica cap in August 2013 with Mr. David Caldwell (former Santa Fe Minerals Exploration Manager at Mule Canyon), observed the siliceous cap is located on top of the volcanic sequence that hosts Fire Creek and beneath a younger, unaltered and barren volcanic sequence that extends to the north. More drilling will define the origin of the vertical veining and the depositional horizon at which minerals were deposited in this system.

Fire Creek has the attributes of epithermal mineralization including mineralized structural conduits that extended to the paleo-surface, remnants of a siliceous sinter cap from hot spring emanations, multiple alteration styles, an epithermal vein-alteration suite, open space vein-fill within actively rupturing fractures with volcanic textures, and bonanza-grade gold deposition in a boiling-zone horizon. A strong characteristic of the mineralized zones is chemical brecciation in wall rock with veining related to dissolution.

To date, Klondex's exploration program, begun in 2004, has tested the potential for mineralization in veins both beneath the surface alteration cap and along the projected and extrapolated north-northwest fracture trends. Using a general epithermal model as a foundation for planning drilling targets, the higher gold grades would be expected to occur within the boiling zone horizon in the vertical vein system at some specific depth under the paleo-surface.

9 Exploration

9.1 Historical Exploration

Below is an itemized chronology of exploration activities at Fire Creek conducted by Klondex.

- 1975: Klondex acquired the property from Placer Development Ltd.;
- 1980 to 1983: Klondex drilled 64 rotary holes;
- 1984: Klondex leased the property to Minex Resources Inc.;
- 1986 to 1987: Klondex leased the property to Alma American Mining Co.;
- 1988 to 1990: Klondex leased the property to Aurenco JV. The Aurenco JV conducted shallow drilling mined and operated a small unsuccessful heap leach;
- 1995 to 1996: Klondex leased the property to North Mining Inc. North drilling confirmed the existing of high grade epithermal veins;
- 2004: Klondex began a deep exploration program for vein mineralization;
- 2004 to 2008: Klondex drilled a total of 180 core holes - most with reverse circulation (RC) pre-collars, for a total of 245,469 feet. During this time, NMC and Klondex performed geophysical surveys, November 2005. Klondex conducted a Gradient IP-resistivity survey in August 2006. A summary of these geophysical surveys from Raven et al. (2011) are as follows:

"Newmont's survey consisted of 38 gravity stations scattered over the area of interest. The 6 square kilometer Klondex gradient array IP Resistivity survey used a receiver dipole of 30 metres and line spacings of 100 metres. The field survey was conducted by Zonge Geosciences, Inc. of Sparks, NV and interpreted and reported by Fritz Geophysics of Fairplay, CO. The data from the earlier North Mining IP survey was also integrated into the Fritz interpretation.

"The gravity survey located a gravity high over the area of mineralization that is bounded by ENE and NW-bounding structures. The IP Resistivity data showed a complex series of IP highs associated with probable NNW structures and layered resistivity responses offset by the NNW structures. There is a correlation between the IP and gravity data confirming possible ENE structures that cut-off IP highs north and south of the mineralization center. The IP highs calibrate well with known vein systems discovered by drilling. The survey results also revealed numerous IP anomalies that have yet to be examined by drilling. These IP highs may represent

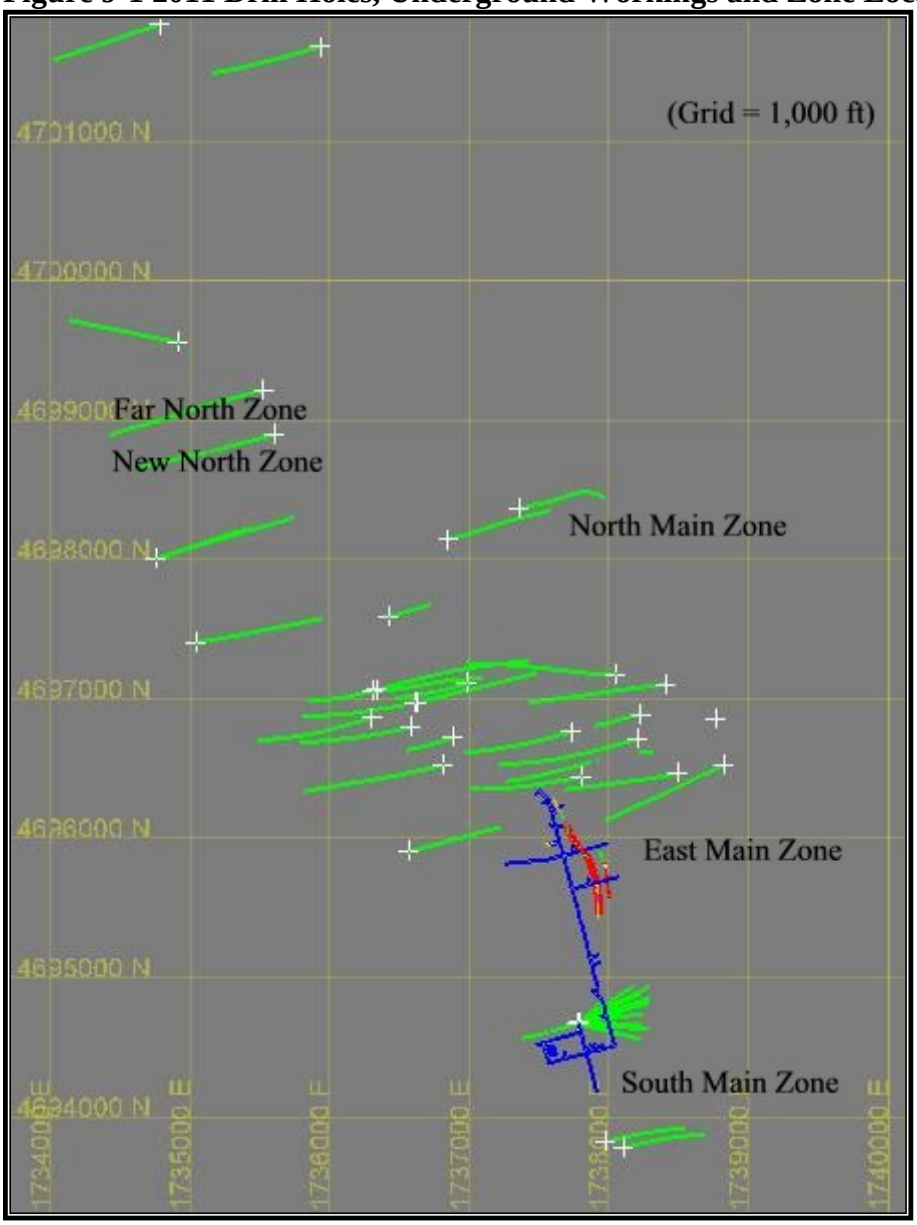
possible undiscovered vein targets but the only way to determine that is through drilling." (Page 20); and

- 2009 and 2010: Klondex drilled an additional 36 core holes, most with RC pre-collars, totaling 47,964 feet for a total of 216 holes totaling 293,433 feet.

9.2 2010 to 2011 Drilling

In 2011, 37 surface holes and 19 underground holes were completed for a total footage of 65,025 feet. Results from this drilling post-date Raven's 2011 NI 43-101 Technical Report. Figure 9-1 shows the location of these holes relative to the underground workings. Surface drilling was focused on identifying mineralization in the Far North, New North, and North Main Zones. Underground drilling was focused in underground Muck Bay 1 to better define the southern extent and character of the South Main Zone. East Main Zone was not active.

Figure 9-1 2011 Drill Holes, Underground Workings and Zone Locations (Klondex, 2013)

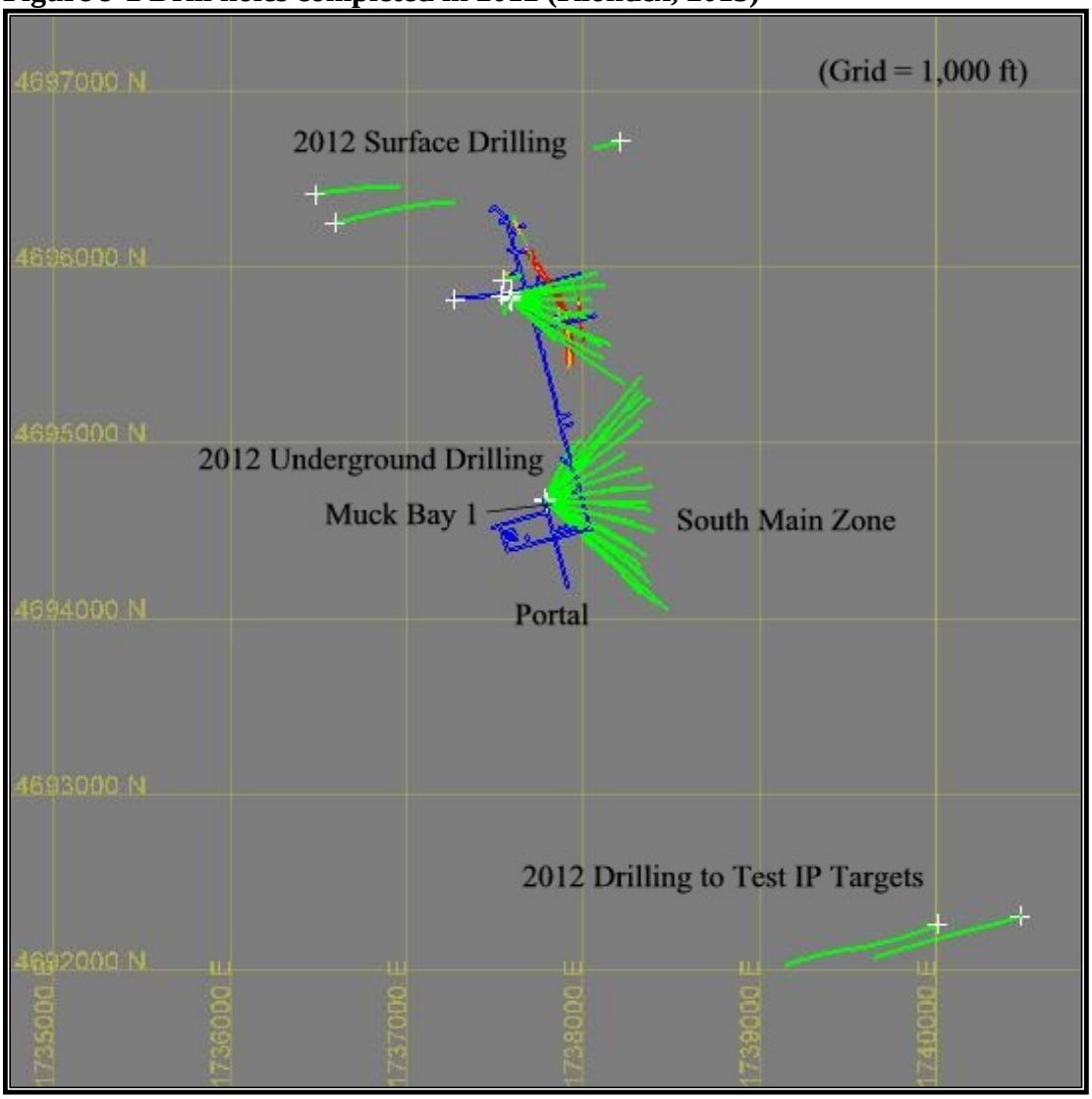


9.3 2012 Drilling

Surface drilling was suspended in February 2012, except during a brief program in June. In June, Klondex operated two RC and one core drill on surface. Underground core drilling continued from January until August 2012, with one drill. In March 2012, three geotechnical core holes (HQ) were drilled underground at test locations for a planned vent raise. In June, a 15-hole drill program with 600 feet of RC pre-collars was initiated, at the same location as the geotechnical holes, to better define a bulk sample area. This area encompasses both the Joyce Vein and Vonnie Vein between the 5370 and 5400 crosscuts. In December 2012, a geotechnical hole was drilled approximately 380 feet west of the original vent raise to test a new location with a lower

collar elevation for lower construction costs. A total of 22 surface holes were drilled for 23,990 feet. A total of 58 underground holes were drilled from Muck Bay 1 totaling 31,701 feet. Figure 9-2 shows the drill hole locations completed in 2012.

Figure 9-2 Drill holes completed in 2012 (Klondex, 2013)

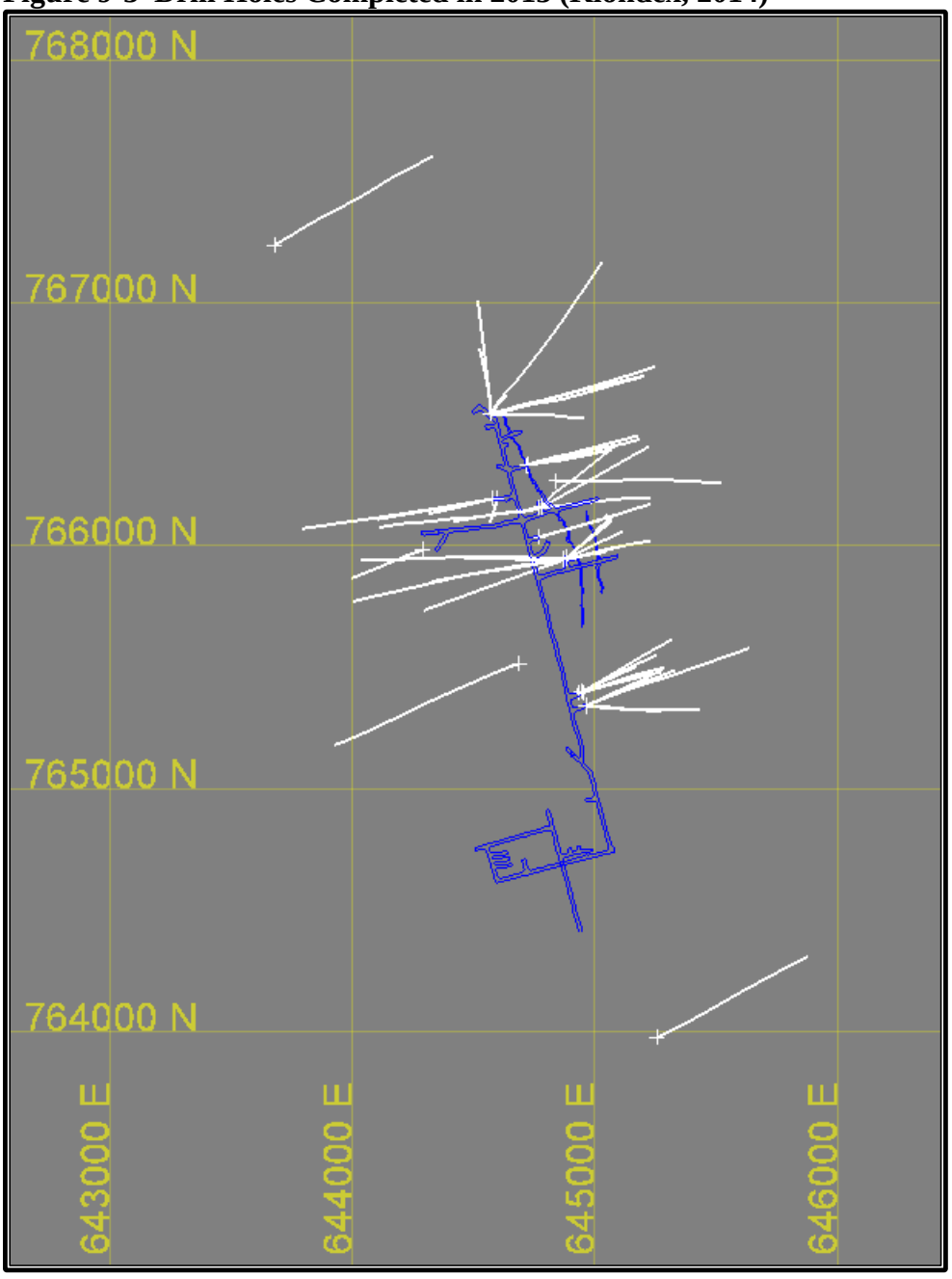


The underground drilling continued to define mineralization in the South Main Zone. The surface drilling intersected the Vonnie Vein with an intercept of 85 opt Au. Holes drilled from surface to the south east in Figure 9-2 were targeting IP anomalies but were located too far east and were unsuccessful at encountering mineralization.

9.4 2013 Drilling

Five surface holes and 57 underground holes were drilled in 2013. Figure 9-3 shows the locations of holes drilled in 2013.

Figure 9-3 Drill Holes Completed in 2013 (Klondex, 2014)



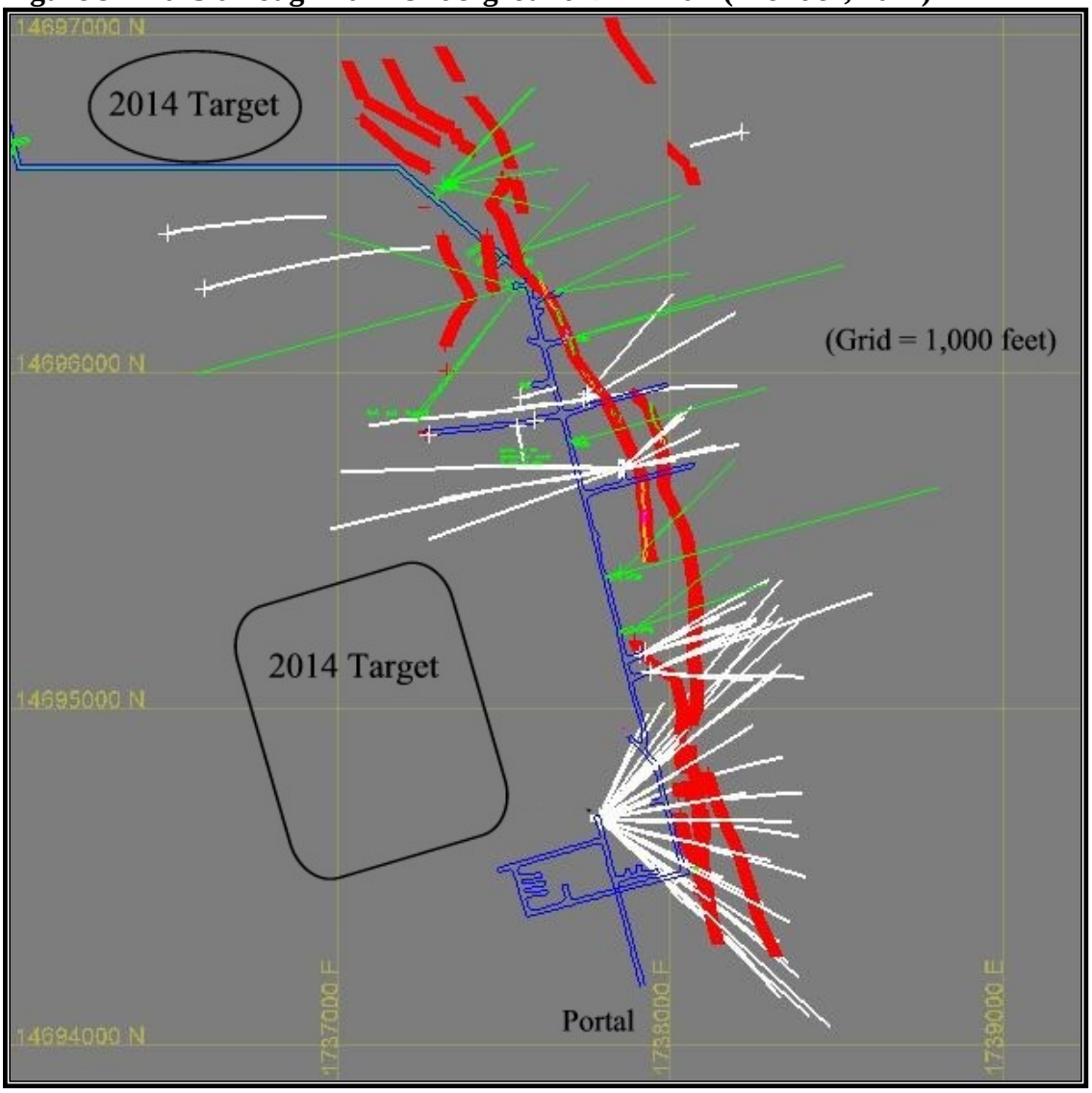
As a result of the 2013 drilling program, multiple new veins have been identified to the west of the decline and probable extensions of the Joyce Vein and Vonnie Vein have been identified to the south.

9.5 2014 Drilling

Underground infill drilling is ongoing and planned to continue in 2014. Approximately 70,000 feet are planned to better define mineralization to the north, west, and south of Fire Creek. Figure

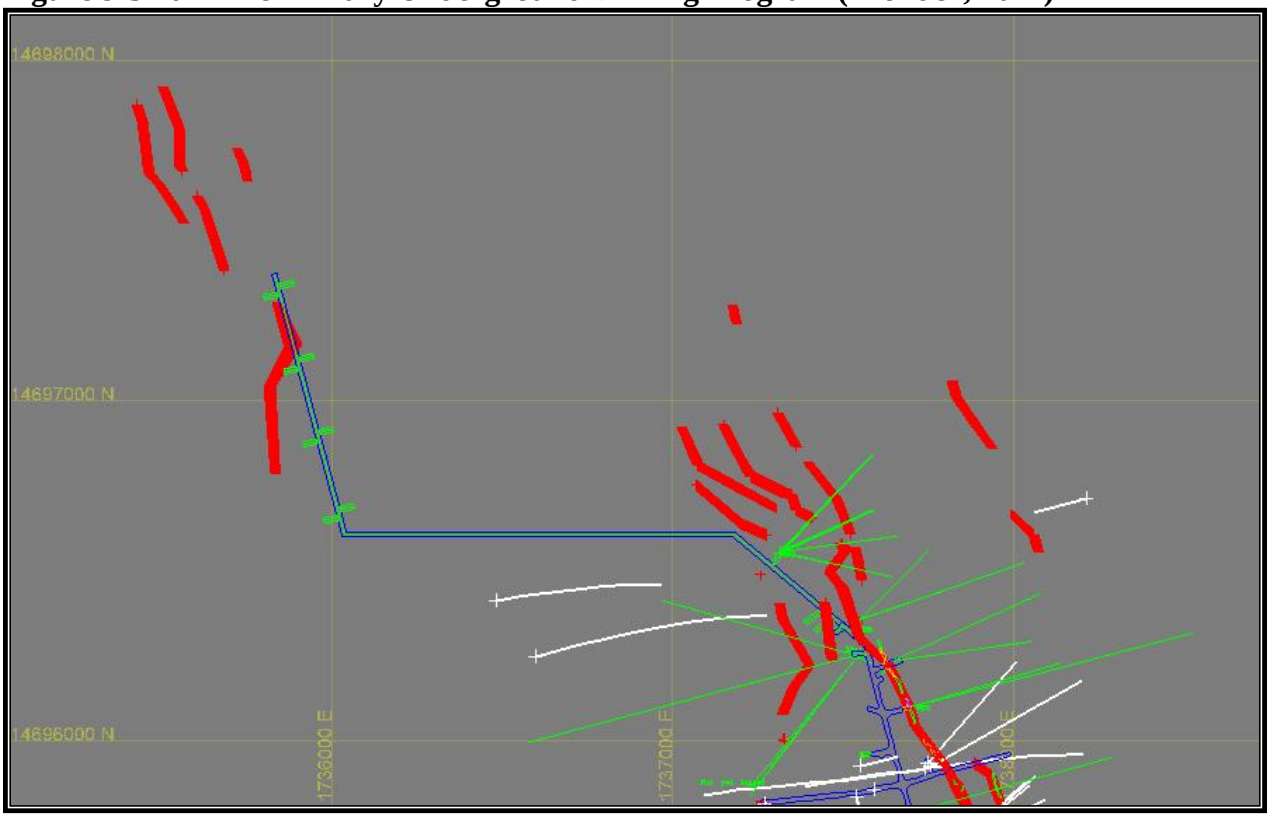
9-4 shows the continuing in-fill drilling program plan for 2014 for two drills (green traces) in respect to previous drilling (white traces), asbuilts (blue), and the current resource model (red). New muck bays will be constructed for the 2014 drilling program. Areas circled in black represent additional targets for 2014.

Figure 9-4 2013 through 2014 Underground Drill Plan (Klondex, 2014)



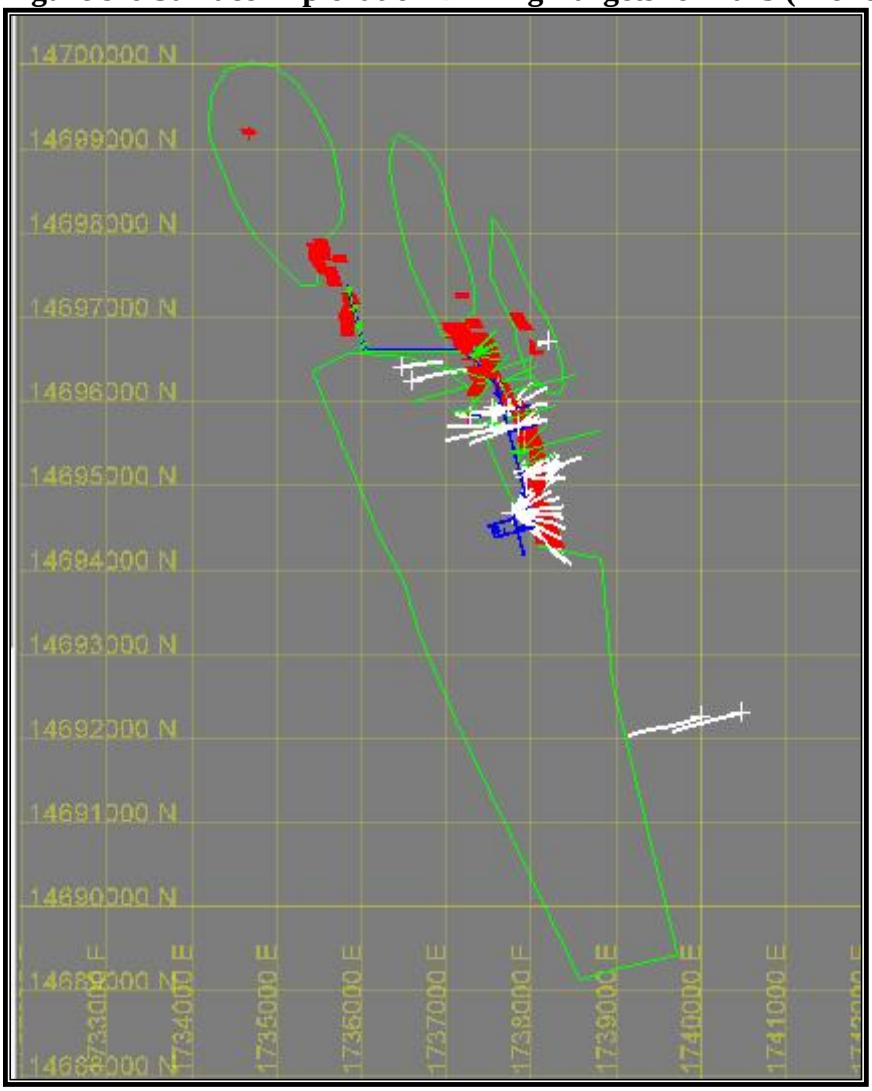
Development drifting is planned to advance west to the New North and Far North Zones in 2014. Figure 9-5 shows a preliminary mine design (blue) that will access the New North and Far North Zones. There is considerable potential for expansive drilling between the North Main area and the New North and Far North zones.

Figure 9-5 2014 Preliminary Underground Drilling Program (Klondex, 2014)



Surface exploration drilling will likely commence in 2015. Figure 9-6 shows potential target areas (green circles) for 2015 surface exploration drilling with current resource model outlines (red), completed drilling (white) and asbuilts (blue). The overall objective of the 2014 surface drilling program is to add additional ounces to the resource. The 2014 drilling program objectives are: 1) target up-dip, and down-dip extensions of known mineralization where underground drilling is inaccessible; 2) extend strike length to known veins and vein intercepts where underground drilling is inaccessible; and 3) identify new mineralization in untested areas within the Fire Creek land package.

Figure 9-6 Surface Exploration Drilling Targets for 2015 (Klondex, 2013)



The authors of this report reviewed the drill data results dated from March 2004 to January 2014 for the current analysis. Details of this data review are summarized in Section 12. As of January 2014, datasets were found to be coherent and standardized. Drill hole log files, assay certification, and other essential drill hole data information were reviewed and found to be satisfactory for use in the new mineral resource estimate. The geology logs for the surface drill holes compare well with one another suggesting that Klondex geologists understand the stratigraphy of the rock units. Details regarding the condition of the Fire Creek drill hole database are discussed in Section 12.

10 Drilling and Sampling Methodology

By the end of August 2013, a total of 580 feet of surface core drilling (one drill hole) and 15,141 feet of underground drilling (35 drill holes) was completed at Fire Creek. Information related to the drilling data and protocols completed prior to 2004 was poorly recorded. Drilling data and protocols between 2004 and March 2010 were previously described in Raven et al., (2011) and are summarized below. Drilling information between March 2010 and 2012 was also collected as described in Raven et al. Drilling data from 2012 through current reporting is also documented below.

Drilling protocols between 2004 and 2012 are documented in Raven et al. (2011):

"A total of 216 drill holes totaling 293,433 feet (89,438 meters) were drilled from 2004 to December, 2010. Most core holes were pre-collared with a reverse circulation rotary (RC) drill that advanced to a planned depth well short of the intended target intercept. The RC holes were then cased and core drilled to completion with HQ (2.5 inch diameter core)-sized core. Two of the borings, 410 and 411, were only rotary holes drilled to completion. RC drilling was done by O'Keefe Drilling of Butte, Montana. Core drilling was carried out primarily by Boart-Longyear out of their Salt Lake office, Ruen Drilling from Clark Fork, Idaho and Major Drilling from Salt Lake City.

"The directions and angles of the drill holes were spotted to intercept the veins as close to perpendicular as practicable within the limitations of the equipment. Most holes were drilled at azimuths of 750 or 2550 and located as close as practical on the surveyed grid lines with azimuths of 750 shown on Figure 10. The line spacings are 50 metres. The deep holes have established that veins or vein systems have a general azimuth strike of 3450 with varying dips ranging from steep westward dips of about 750 to steep eastward dips of about 800. Most holes were inclined at an angle of -450. Holes were drilled both ENE and WSW; sometimes the ideal direction/declination had to be compromised because of drill location setup problems.

"The Klondex holes are all surveyed for vertical and horizontal deviation by International Directional Services LLC, whose local office is in Elko, Nevada. Plotting the boring deviations permit accurate vein and other gold anomaly intercept locations leading to reliable geologic mineralization locations, interpretations of vein trends, structure dips, zone widths, reserve estimates, and polygon locations." (Page 21)

The 2012 surface drilling procedures for RC are summarized below:

1. Klondex contracted Rimrock Drilling Services from Elko, Nevada to drill fifteen 600-foot RC pre-collar holes;

2. Surface collar locations were based on the location of previously drilled and surveyed geotechnical holes. The azimuth and dip were set using a Brunton compass and measured with a tape, the designations were written on a flagged lathe;



3. The drill rig set up to drill a fan pattern, the mast was checked for correct azimuth and dip prior to drilling;

4. Five-inch surface casing was installed for the upper 20 feet;

5. Drilling advances were paused at the end of each sample run to flush out the cuttings;

6. Upon completion of the hole, International Directional Services (IDS) of Elko surveyed the collar azimuth, dip, and downhole inclinations using a gyroscopic downhole survey tool;

7. The completed RC hole was cased to 600-foot with five-inch casing; and

8. Variations of azimuth and dip for subsequent drilling within the fan array were based on the results of the pre-collar survey and adjusted to account for any deviation, which may have occurred.

The 2012 surface drilling procedures for core are as summarized below:

1. Klondex contracted American Drilling Corporation from Winnemucca, Nevada to drill surface core holes;

2. Prior to drilling, the pre-collars were cemented at the bottom of the casing to seal the core hole;

3. HQ diameter core was drilled with five-foot core barrels and ten-foot rod lengths;

4. Core material was retrieved using a triple-tube and placed in cardboard boxes;

5. Downhole surveys of the entire hole (RC and core-tail) were taken by IDS. A digital copy of the IDS report was emailed to Klondex;

6. Boxes of core were transported to the logging facility for photography and collecting geological observations before being sent to the splitter for sample preparation; and

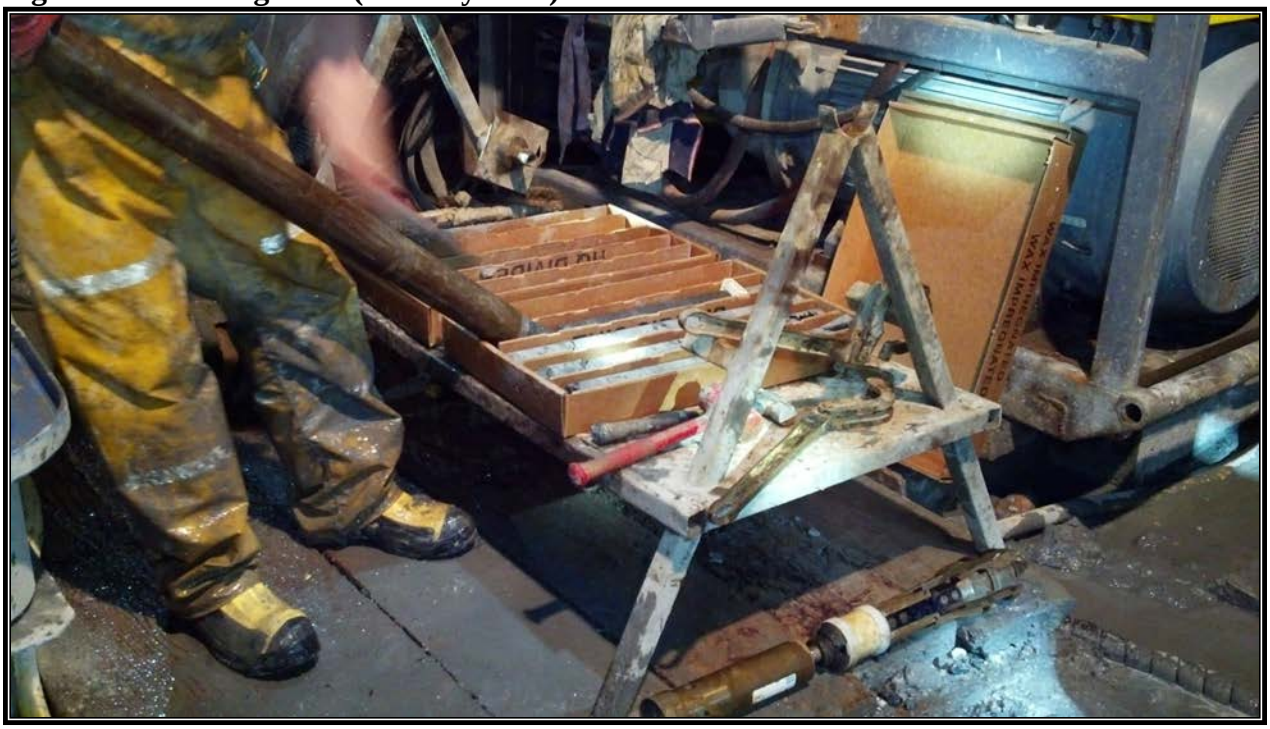
7. Surface drill collar surveys were taken by Alidade, Inc. (“Alidade”) when drilling the fan was completed.

In January 2013, authors of this report observed a sequence of handling underground drilled core as follows:

1) Drill hole status is tracked on a dry erase board as well as in MS Excel spreadsheets for the following information: (drilled status, logging status, sampling status, dispatching a hole, and receiving assay results);

2) Handling of the drilled core from the station includes: drilling with a Diamec U8 core rig (other types of drill rigs have been used in the past for drilling both surface and underground). Drillers label core box lids with a unique Bore Hole Identification number (BHID, which includes the year), box number, and drilled interval, drillers put the core in boxes (shown in Figure 10-1) with top of drilled sequence leading the run in the box and end of drilled interval ending the run in the box. Drillers label the end of the run to the nearest one tenth of a foot and measure and record the recovery in feet on wooden blocks, which are put at the end of the drilled interval;

Figure 10-1 Placing Core (January 2013)



3) Drillers stack full core boxes on a pallet in numerical order; and

4) Drillers or geotechnicians either deliver the pallet to surface or take a partial delivery of core boxes in the back of their motorized underground personnel vehicle. They leave the pallet of core boxes (or individual core boxes on a spare pallet) at the core logging facility.

10.1 Collar Surveying

Historic surface drill collar survey data was kept in Reno, Nevada by Mr. Richard Kern of MinQuest, Inc. ("MinQuest"), as he was the Project Manager and responsible person for the database on behalf of Klondex. Klondex received the historic data in spreadsheets from Mr. Kern in May 2012. All collar northings and eastings came from MinQuest at that time with exception to the 2012 drilling. The elevation of the drill hole locations in this dataset were adjusted by Mr. Steve McMillin, former Chief Geologist for Klondex, by assigning elevations from topographic contours generated from 2012 photogrammetry. All surface collars drilled by Klondex in 2012, specifically FC1208S through FC1223S, were surveyed with a Trimble Global Positioning System (GPS) by Alidade.

Underground drilling began in 2011. Drill collar locations were originally derived from drill station planned coordinates until a revision in protocol in 2012.

Historic methods and record keeping for surveying surface and underground drilled collar locations to early 2013 were inadequately documented. As a result, a re-survey of surface drilled collar locations in 2013 has since validated the historic surface collar locations.

Channel samples along production drifts were also incorporated into this mineral resource estimate. The channel sample locations are stored as "synthetic drill holes" in the database in order to utilize them spatially with software (northings, eastings, elevations, azimuth, dip, and length). The northing, easting, and elevation of the samples were derived from geologists' calculations and are based on underground survey mapping (asbuilt).

10.1.1 Surveying Surface Drill Collar Locations

There are no surviving survey reports or documentation of surface collar location methodologies from March 2004 through December 2010. The (non-documented) method for locating early collars was to locate the drill pad along a surveyed grid of lines (lines spaced 50 feet apart) to intercept veins as close to perpendicular as possible within the limitations of the equipment and topography.

In August of 2008, Alidade surveyed and located some of the drill pads and collars for Small Mine Development, LLC. ("SMD"). Historical survey reports for that period have not survived though Alidade's methodology for ground control is documented in a Company memo from Alidade (Klondex, 2006):

"On our first day on the project we set a 5/8 rebar with a plastic "Alidade Control" cap on a hillside above and about a 1000 feet north of the mine site. We set up our GPS receiver on this

point called "AL1", and recorded 2 plus hours of static GPS data at 1 second intervals. This data was subsequently sent to the National Geodetic Survey (NGS) Online User Positioning Service (OPUS) and processed.

"OPUS provided both the NAD83 Nevada Central Zone and UTM Zone 11 North coordinate values for the new point. The grid coordinates provided were expressed in meters for both systems as is standard for OPUS. We (Alidade) converted the NAD83 coordinates from meters to US Survey feet and established a coordinate system and projection for our GPS software."

Since 2010 (up to drill hole FC1207S), surface collar survey information was recorded by the site geologist reading a hand-held GPS device on the drill rig. Using a hand held device requires the geologist to allow the device to sit for approximately 20 minutes before a reading can be taken. The coordinates were hand-entered on a log form. The original datum is unknown. It is also not known if any conversion between datum was made as a part of this process.

After January 2012, surface drill collar locations were surveyed by Trimble Real Time Kinematic ("RTK") using a GPS device with a base station of a known survey point and rover unit. There are no surviving survey reports from this methodology. The original datum is not known. It is also not known if any conversion between datum was made as a part of this process.

In June 2013, a re-survey of surface collars in the vicinity of the Main Zone of mineralization was conducted by Mr. McMillin, to verify the locations of the historically drilled surface collars. This survey method consisted of locating a population of 29 drill holes out of a total of 209 surface drill hole collars, using a ground magnetometer and a track excavator to search for buried collar casing.

A total of 29 surface holes (approximately 14% of the surface drill hole population) were located and re-surveyed by Klondex using a Trimble RTK unit with average northing and easting errors of 5.39 and 5.71 feet, respectively.

Table 10-1 Surface Drill Collars Re-surveyed by Klondex

BHID	Eastings	Northings	Elevation	PROJECTION SYSTEM
FC1207S	14696485.18	1737337.22	6055.043	NAD 83
FC1208S	14696484.23	1737332.01	6055.256	NAD 83
FC1209S	14696489.35	1737337.59	6055.136	NAD 83
FC1210S	14696480.66	1737331.12	6054.994	NAD 83
FC1211S	14696478.28	1737335.75	6055.341	NAD 83
FC1212S	14696478.45	1737331.66	6055.134	NAD 83
FC1213S	14696470.69	1737334.5	6054.263	NAD 83
FC1214S	14696471.37	1737331.63	6054.913	NAD 83
FC1215S	14696472.21	1737327.84	6055.272	NAD 83
FC1216S	14696465.29	1737334.07	6054.913	NAD 83
FC1217S	14696467.25	1737329.53	6054.438	NAD 83
FC1218S	14696464.22	1737333.05	6054.379	NAD 83
FC1219S	14696457.89	1737328.95	6054.24	NAD 83
FC1220S	14696460.78	1737325.61	6055.07	NAD 83
FC1221S	14696463.23	1737322.85	6054.835	NAD 83
FC1207S	14695832.79	1737596.9	6055.043	NAD27
FC1208S	14695831.84	1737591.69	6055.256	NAD27
FC1209S	14695836.96	1737597.27	6055.136	NAD27
FC1210S	14695828.27	1737590.8	6054.994	NAD27
FC1211S	14695825.89	1737595.43	6055.341	NAD27
FC1212S	14695826.06	1737591.34	6055.134	NAD27
FC1213S	14695818.3	1737594.18	6054.263	NAD27
FC1214S	14695818.98	1737591.31	6054.913	NAD27
FC1215S	14695819.82	1737587.52	6055.272	NAD27
FC1216S	14695812.9	1737593.75	6054.913	NAD27
FC1217S	14695814.86	1737589.21	6054.438	NAD27
FC1218S	14695811.83	1737592.73	6054.379	NAD27
FC1219S	14695805.5	1737588.63	6054.24	NAD27
FC1220S	14695808.39	1737585.29	6055.07	NAD27
FC1221S	14695810.84	1737582.53	6054.835	NAD27

Additionally, surface drill hole FC1222S, drilled in late November 2012, was surveyed by Mr. McMillin using this same methodology. Currently, surface collar surveys are taken by Carl C. de Baca, of Alidade, using a Trimble RTK roving unit and base-station set on a known survey point based on projections described above.

The result of locating the 29 drill hole collars verified the historic collar coordinates for the surface holes as being accurate and within acceptable means. The authors consider the results of this study as validating the historic surface collar locations.

10.1.2 Surveying Underground Drill Collar Locations

Underground drilling began in September of 2011, and all of 2012 underground drilling was conducted from one station: Drill Station 1. Underground collar location surveys were not completed until February 2012. Holes FC11002U through FC12059U were surveyed initially in February and then finalized in August 2012 by SMD surveyor Paul Joggerst (2012 Joggerst), utilizing North American Datum (NAD) 27 UTM US feet.

The initial survey by Joggerst in February 2012 was incomplete because drilling was ongoing and not all collars had been clearly labeled for the surveyor. As a result, there were abundant errors recorded in BHID. In August when the core drilling program was shut down, SMD re-surveyed all the underground holes with the exception of FC11001U. That collar has never been located, and its coordinates are approximated. As a result, FC11001U hole was never assayed, and it is not included as part of the current mineral resource estimate.

The 2012 Joggerst methodology included use of a robotic total station set by plumb-bob using a known survey location as datum. A survey rod with a prism attached was then used by the surveyor on each drill collar location. The total station followed the prism until the surveyor identified the point on his data collector and the survey was completed. Plastic livestock ear-tags were wired to the collar casing pipe to identify the hole. 2012 Joggerst provided survey reports to Klondex in the form of electronic spreadsheets. All underground surveys were conducted in NAD 27 UTM, US feet. The last surveys for 2012 were collected in August. Numerous holes were located in Drill Station 1, and a geologist assisted the surveyor to identify each hole.

The 2013 underground surveys were initially taken by Rough Stock Mining Services beginning in early February and were then re-surveyed by Klondex later February 2013. This later survey is considered the final survey. All 2013 underground surveys were utilizing NAD27 UTM US feet, and in 2014 Klondex began using NV SPCS feet.

Currently, Klondex staff surveys underground collar locations using Company-owned survey equipment. Fire Creek's survey equipment is a Trimble S6 DR Plus total station device used in conjunction with Leica prisms. Control points are set in the back of the drift and decline and traversed back with the resection program.

10.1.3 Surveying Channel Sample Locations

The spatial position of channel samples are determined by the sample's relative position within the asbuilt mine survey, rather than by direct survey. The geologists measure from known surveyed reference points to the starting point of the channel sample and record this

measurement in their log sheets. The coordinates of the channel sample are estimated when plotting these measurements on the asbuilt survey.

Modeling the location of channel samples with respect to surveyed asbuilt locations in spatial array has verified the location of the channel samples well enough for the authors to accept their contribution to the mineral resource estimate. Development decline sampling was not included in the new, re-created data set.

10.2 Downhole Surveying

Historic downhole surveys for surface drilling are summarized below from Raven et al., 2011:

"The Klondex holes are all surveyed for vertical and horizontal deviation by International Directional Services LLC, whose local office is in Elko, Nevada." (Page 21)
No documentation exists for downhole surveys prior to 2011.

Underground downhole drilling and subsequent downhole surveys began at Fire Creek in the fourth quarter of 2011. Klondex leased a PeeWee downhole survey tool from Minex in Minnesota (PeeWee). The PeeWee has the option of being manually set for local declination or simply collecting data. Klondex collected raw uncorrected data and then applied corrections to compensate for the local declination of 13.35 degrees according to the NOAA calculator.

Readings are taken by the PeeWee every 50 feet. If the raw data from the PeeWee reflects some fluctuation in measurements, data is removed from the database. In that case, reliable points above and below the erroneous point are used for projecting the drill hole. Occasionally, the surveyor at Fire Creek will use "collar and quill surveys" by positioning the prism rod in the collar and recording multiple survey shots of azimuth and dip.

Beginning in 2014, all underground downhole surveys are performed by International Directional Services (IDS) using a Maxibor tool.

As of 2013, IDS performs the downhole surveys for Klondex surface drill holes using a Maxibor gyro tool from their office in Elko.

10.3 Core Recovery

Core recovery has previously been described (Raven et al., 2011) and is summarized below:

"Core recovery was excellent; 100% in most instances. The high-grade intervals were logged as having near or 100% recovery in nearly all cases, whether the intercept was a vein or a breccia zone. Core recovery was typically very good throughout the Klondex program." (Page 21)

Since 2012, the percent core recovery has been calculated by measuring the material between blocks per drilled interval. The percent recovery is then calculated by dividing the measured recovery by the run footage and multiplying that value by one hundred. The average current recovery for the underground core at Fire Creek is 95%.

10.4 Security Procedures

From early 2004 until March 2012, material from split core, rejects, RC chips, and pulps were stored in multiple storage units at the business of Security Storage, 355 East Greg Street, Sparks, Nevada. RC chip and rejects were transported directly to these storage units either from Fire Creek or from the ALS Minerals (ALS) Lab in Sparks, Nevada. Core material was first logged at the Project by a MinQuest geologist and then transported to Sparks for cutting and sampling by a MinQuest geotechnician. After cutting and sampling, the core was archived in one of the storage units.

For the 2013 core re-logging program, core was retrieved from storage units in the Sparks warehouse and moved down the street to a rented logging warehouse. Once the re-logging was complete, the core was palletized, banded, and wrapped for shipment back to Fire Creek. Currently, the banded core boxes are stored at the Project in a ‘mud yard’ pending construction of a fenced and protected facility.

10.5 Logging Drilled Core Observations

Klondex’s historical lithology database, prior to the 2012 acquisition from MinQuest, contained data in two forms: section images and a summary of graphical logs. These pre-2012 forms utilized interpretive unit names that lumped tuff and basalt units and the lithologic numerical codes to one decimal point. The historic logging was conducted on paper forms, then hand-entered into RockWare LogPlot software. Detailed observations were reduced to interpretive unit codes, which comprised the lithology portion of the database. The core and RC portions of the holes each had separate logs.

Klondex’s logging format was revised in 2012 with a new code system. The new codes allow tuffs and basalt lithologies to be separated into specific units that will allow reinterpretation of the Fire Creek stratigraphic section for more detailed modeling. Geologic breaks, defined by the new coding system, are paramount in determining sample widths. The selection of sample intervals is determined after logging geology, alteration, mineralization, and structural observations.

During 2013, Klondex re-logged approximately 240,000 feet of core to document the details of tuff and basalt units according to the new coding system and to obtain better assay resolution on

mineralized intervals. The re-logging program focused on a better understanding of lithologies and alteration and also captured photographs of the core. Additionally, better density information and multi-element analytical data were also collected. Previous sampling was based strictly on five-foot sample intervals regardless of geology. This was an issue at Fire Creek because mineralized veins occur within only a portion of a five-foot interval, and resultant assays do not accurately reflect either the size of the vein or the distribution of gold. On occasion, veins were also misrepresented during core splitting, and the result was a loss of assay opportunity. In 2013, re-logging included re-sampling of several mineralized intervals that were either split or represented a fraction of a five-foot interval. New sample interval footages were selected to blend into the previous sample numbering sequence without gaps or overlaps. The new sampling intervals were determined by geological observations.

The significant lithological contacts at Fire Creek which determine mineralization are interbedded basalt units, tuff, and dikes. Klondex's lithological database used in the resource model utilizes the new interpretive lithological codes for these tuffs, basalts, and dikes (and faults) to constrain the geological model. The tuff units used in the model were derived from both the older RC Log Plot descriptive data and the newer log format. The historic MinQuest database contained numeric codes for the interpretive units that do not give enough information as to the specific location of internal tuff units, as shown in Table 10-2.

Table 10-2 Historic Klondex Codes

Unit	Unit Code
None	-1.00
Surficial	0.00
Tb1	11.00
Tb2	1.00
Tb3	2.00
LAT	3.00
Tbeq 1	12.00
Tbma	4.00
Tvft	5.00
Tbeq/Tbeq 2	6.00
Tuff & Basalt	7.00
Dike	9.00
Battle (Battle Mountain Conglomerate)	13.00
Valmy (Valmy Formation)	10.00
Undifferentiated Basalt	0.00
Tuff Beds	0.50
Fault	0.0F or 0.5F
Breccia	0.0X or 0.5X

Some of the new codes in the database were derived directly from reading the geologists' detailed descriptions in the comments field as to veins, structures, and most importantly, the tuffs or basalts. This is why a direct correlation between the original logs and the Klondex database is complex. Portions of the current Klondex database refer to historic RC logs, some portions of the database refer to the results of the re-logging program in 2013, and some of the lithological codes in the Klondex database are derived from the detailed observations in the comments field rather than from the lithological code.

Original logs were code-based on unit names with minimal geologic information. Newer logging has been based on lithology with the objective of re-interpreting the stratigraphy to conform to growing understanding of the geology. Early in the re-logging effort, dikes were not specifically listed as a rock type, and variations in tuff types were not delineated. As logging progressed, codes for these variations were inserted into the logging format. As a result, review of historical log descriptions formed the basis of re-identifying dike intervals from the earlier holes.

Each of these geological logging systems was reviewed by the authors, and the results validate the geology in the Klondex database. Direct correlation between the original logs and the database validated the lithology database. Lithological data entries for 134 channel samples that contain gold were also reviewed by the authors and found to be a good correlation with the database.

10.5.1 Re-logging Protocol for 2012

In January 2012, inadequacies in historic logging procedures became apparent, specifically the following issues:

- No core before 2012 had been photographed;
- Sampling intervals were strictly five-foot regardless of lithological or structural contacts, and sample intervals were often chosen prior to collecting logged observations; and
- Observations of lithology and alteration were broadly generalized.

Until April 2012, core was logged at Fire Creek and then shipped to Sparks, Nevada for processing. Split core was shelved in 23 storage units at Secure Storage in Sparks, Nevada.

In October 2012, Klondex began to re-log the core stored in Sparks before relocating it to Fire Creek, the objectives being to:

- Improve grade definition on veins that were diluted within a five-foot interval or overlapping intervals;



- Improve detailed observations of alteration and lithology; and
- Improve details of the stratigraphic sequence at Fire Creek.

Two new 4,500 square foot warehouse units were rented within two miles of Secure Storage. One unit was equipped with eight roller-conveyor tables 70-foot long and two camera stands. Suspended fluorescent lighting was added to provide better lighting to compensate for ceilings 20-foot in height. The other unit was used to store the core in progress.

Twelve contract geologists and eight geotechnicians worked the re-logging program to complete the following tasks:

- Moving core;
- Washing core;
- Photographing core;
- Logging core;
- Sampling core;
- Measuring density and magnetic susceptibility of the core; and
- Palletizing core for long-term storage.

Logging core included collection of geotechnical data, such as strength, approximate Rock Quality Data (RQD) from split core, lithology, alteration, structure, mineralization, and vein density. Density measurements were taken using a water-immersion densi-meter after sealing samples in wax (Figure 10-2).

Figure 10-2 Densi-meter



Core selection for re-sampling focused specifically on localized alteration and veined material, which were previously diluted by sampling in five-foot intervals, and re-sampling of veins that were split into multiple samples in overlapping intervals, diluted by waste or wall rock. The remaining, un-sampled core was consumed for re-assay, and the intervals in the core boxes were marked with lathes.

Additionally, composite chip samples were collected for 48-element Inductively Coupled Plasma (ICP) analysis throughout the core on 20-foot intervals. Samples were sent to ALS in Reno and Inspectorate in Sparks for analysis.

In total, 228,814 feet of core was re-logged out of an estimated 240,000 feet. The estimated footage was based on the footage totals in the Klondex database. The difference in footages is a result of discarding core from the upper portions of the holes drilled in unaltered basalt. A Micon inventory list indicates 14,400 feet of core from 29 holes was discarded. Some of this discarded

material was used for blank reference material. There are no surviving records citing how much core was used for this purpose.

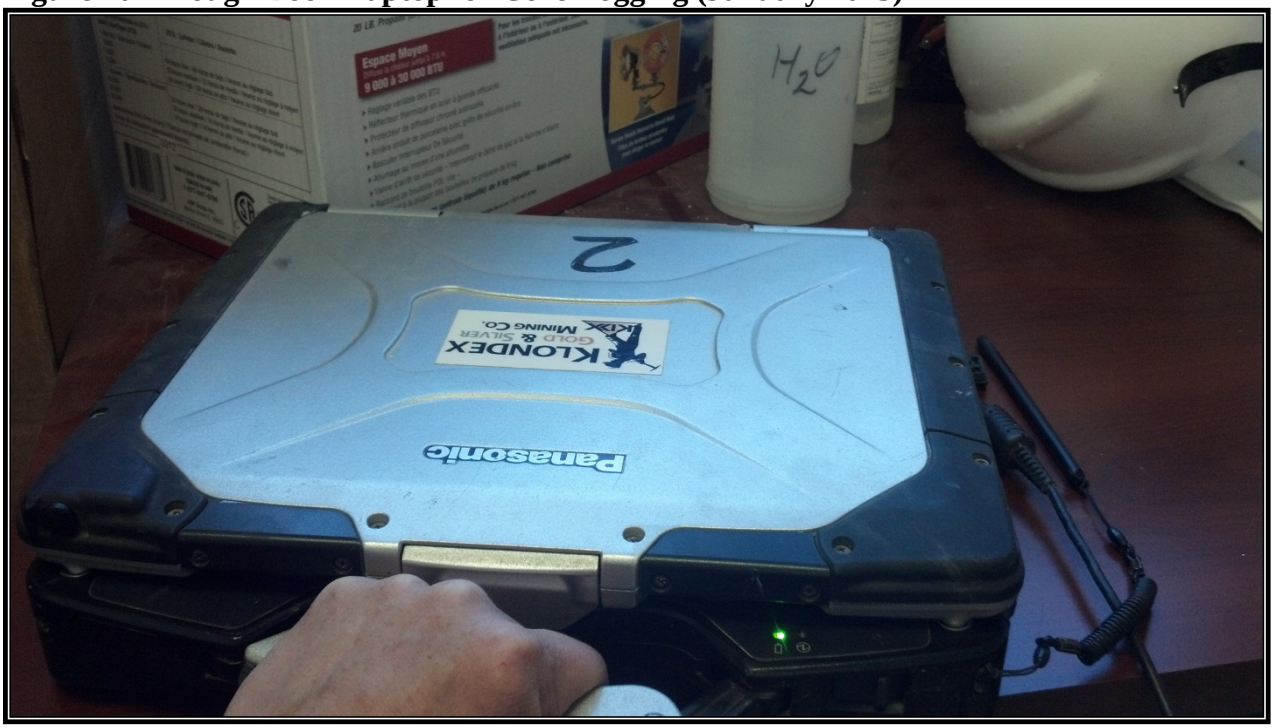
10.5.2 Current Logging Protocol - 2013

Core is currently logged in a Project core logging facility (Figure 10-3) utilizing electronic spreadsheets populated with links to lookup tables on a Panasonic Tough Book ("Tough Book"), with touch-screen capability (Figure 10-4). Data collected includes header, structure, lithology, alteration, mineralization, and rock quality designation ("RQD", an index of how rock mass or competence favors tunneling). Errors, such as data overwrites and overlapping sample intervals, can occur because the data is not write-protected. Each Tough Book is designated for a specific drill hole, one at a time. An electronic 'drill-hole-specific' Excel spreadsheet is populated beforehand with header information and assigned unique sample identifiers ("SampleIDs"). Multiple users can use the same Tough Book to log the core. The users' initials are entered in the header as general contributors not on an interval by interval basis.

Figure 10-3 Core Logging Facility, (January 2013)



Figure 10-4 Tough Book Laptop for Core Logging (January 2013)



Beginning June 2013, Klondex geologists began a quick log assessment prior to detailed logging in order to quickly identify important contacts and to verify intersections or expected horizons in the core. The advantage of this additional step is an updated geologic model as soon as the core is available for preliminary review as opposed to waiting until all the logged data is collected. The quick update to the geologic model allows for modifying the Fire Creek drill plan in order to better intersect mineralization and to refine the mine plan.

10.6 Core Sampling Methodology

Beginning in June 2013, authors of this Technical Report observed a sequence for handling and sampling drilled core according to the following protocol:

1) Geologists or geotechnicians set the core boxes on rolling racks in an illuminated, heated, covered plasticized canvas logging facility;
2) Core is washed and photographed;
3) Core is logged utilizing electronic spreadsheets on a Tough Book;
4) Geologists enter sample intervals FROM and TO values in the spreadsheet between one and eight feet intervals, not crossing contacts or alteration boundaries. This spreadsheet was previously populated with SampleIDs reserved for that specific hole. SampleIDs for QAQC were previously populated in the SampleID sequence as well. SampleID sequences (as well as BHID) for underground differ in nomenclature from surface

drilling sequences to distinguish between the two sources. "S" is used as a suffix for surface drilled holes, and "U" as a suffix for underground drilled holes;

5) Logged core in boxes are returned to an outdoor pallet waiting to be split; and
6) Geologists print a cut sheet for the splitter. QAQC sample numbers are included in the cut sheet.

10.7 RC Sampling Methodology

1) RC samples are taken on five-foot intervals using a rotating wet splitter;

2) Water-flow and sample size are controlled by adding or removing splitter slot covers. The number of covers are tracked for each sample;

3) A sample cut-sheet is populated with sample numbers and footages, incorporating intervals for QAQC samples as well. The cut-sheet tracks sample numbers on bags and intervals in the rock chip trays;

Note: Standards, blanks, and duplicates are inserted every 20 samples. The optimum sample size collected is approximately one quarter to one half of a 17-inch by 22-inch sample bag (about 20-30 pounds.)

4) A population of reference chips are collected in a sieve from each sample run and placed in 20-compartment sample trays;

5) Sample bags are placed in a five-gallon bucket under the wet splitter;

6) The sample buckets are placed inside a 20-inch diameter by six-inch deep rubber pan;

7) If the sample bag in the bucket overflows into the pan before completion of a five-foot sample run, then the run-off is re-poured into the sample bucket to recover any fine material; and

8) Buckets and pans are washed after each run, and the wet splitter is washed after each rod change.

10.8 Channel Sampling Methodology

Channel samples collected between 2012 and 2013 were also incorporated into this Technical Report mineral resource estimate. A rib sampling program began in January 2013 with the development of the main decline. As of the date of the current mineral resource estimate, 680

samples were collected in 139 channels. Channel sampling procedures for both the Face Sampling and Development Decline are summarized below.

10.8.1 Face Sampling

In late April 2013, channel samples were taken from the active faces exposed from each round, including sampling exposed vein and host rock on both sides of the vein in the face. A battery-powered impact hammer was used to sample in straight, uniform lines at set heights from the sill. Two sets of linear channel samples were collected from the face: one set six feet up from the sill, and one set two feet up from the sill. Each set of samples recovered material from the vein and the wall rock to the left and right of the vein (if present). These samples were labeled FCF000001 through FCF000172. Additionally, chip samples from the ribs on either side of the face were collected with a rock hammer in a line along drift five feet above the sill and extending back from the new face to the previous face.

By May 2013, from sample FCF000173 on, the sampling methodology was updated to collect material from the face by hand with a rock hammer in a less linear means that would represent mineralogy, alteration, and width of the vein more realistically. The new method was based on a system developed at Midas. The new method is to use a rock hammer to chip off multiple fragments in the face across the vein and wall rock representing all material from a variety of features, such as silicified patches, oxidized breccias, vug-fill, free gold, etc. The Klondex geologist collects various features proportionately within a measured zone for one sample. The previous methodology did not allow for sampling any material from features that did not occur along the six-foot and two-foot height linear swaths, which restricted assessment of mineralization. The new sampling methodology is technically, ‘area sampling’. Rib sampling techniques did not change.

The new methodology for sampling face material is as follows:

1) Before sampling and mapping a face, the geologist will wash the face with water from a hose to expose the vein, structures such as faults, and alteration and to remove contaminants from the blast;

2) Sampling and mapping follows the wash;

3) Three samples are collected from the face: left wall rock, vein, and right wall rock from left to right. The area sampled is from the sill to the extent of reach by hand;

4) In addition to collecting three samples across the face, the geologist also collects samples from the left rib, right rib, and vein-only material in the back;

5) Samples consist of chips removed by rock hammer into a clean bucket and then transferred to a bag. The bucket is washed between sampling;

NOTE: The method of labeling bags varies. A geologist may pre-label the bags one through six, or pre-label the bags with a predefined SampleID in sequence from the central spreadsheet. Sometimes, a geologist labels bags during sampling.

6) All samples have a three letter prefix followed by a six digit number: FCF000000 = face or rib samples; FCM000000 = muck samples; FCG000000 = miscellaneous underground grab samples;

Note: Back samples were previously collected across the entire back from left wall rock across the vein to the right wall rock in a straight line. This methodology was revised. Currently, only one 'area' sample exclusively from the vein is collected along the back. Samples from the back are collected from vein material for the width of the vein in a swath starting from the previous face and continuing to the current face. The back sample material is collected with a scaling bar to pry off intact pieces of the vein into a bucket, which is cleaned between each sample.

7) Additional samples, such as rib samples located further from the current face or samples of specific vein feeders and offshoots, are collected after the first set of sampling the new face is finished;

8) After the sampling procedures are completed, the geologist maps the face and records vein widths, sample locations, and structural features in hand-written notes;

9) The geologist marks the vein margins, structures, face heading, and distance with spray paint on the wall rock;

10) The geologist photographs the face;

11) The geologist takes the bagged samples to the geology office and hand enters data into a central Excel spreadsheet including SampleID, face distance, date, geologist name, sample widths, and a geologic description of the sample. QAQC materials, such as blanks and high-grade standards, are inserted into the sample batch at this time;

NOTE: The location of the sample channels are measured from drift entrance points and posted on face sheets and plan maps. Location sheets are then scanned. Channel locations (faces and ribs) are digitized with Vulcan Software. Channel collar eastings, northings, and elevations are obtained using Vulcan software. Individual sample widths are obtained from mapping at the time of sampling. Channel location coordinates are exported from Vulcan into CSV (comma-

separated values) formatted collar files. Sample width values are hand entered into CSV formatted sample files with assay results posted from laboratory reports. The channel sample files are then imported into Vulcan Software and modeled as synthetic drill holes using the eastings, northings, elevation, width, and assay values.

12) All samples collected within a twelve-hour shift are entered into a sample submittal form, which is saved on the company server;

NOTE: QAQC samples were not utilized in the channel sample stream until June of 2013, after which blanks and standard reference material was added to each sample batch.

13) The samples are sent to the assay lab after every twelve-hour shift; and

14) Channel samples are rarely tracked. SGS provides a three- to four-day turn-around time between receipt of sample and assay results. If there is a delay, Klondex holds advancing the heading pending the assay results. In this event, Klondex will identify the missing sample by using an Excel sample tracker spreadsheet maintained by production geologists.

10.8.2 Decline Sampling

Beginning in January 2012, channel sampling of face and ribs in the underground decline was implemented to locate any un-anticipated mineralization which might be intercepted during mine development. Initial decline sampling was performed inconsistently due to staffing limitations. As the geologic staff increased, underground sampling of the decline face and ribs became routine. Assay results from daily sampling of the decline were mostly below cut-off grade. Eventually, the decline was only sampled when significant assay results from development muck had been intercepted. In those cases, a geologist returned to the corresponding area in the decline to sample the ribs.

NOTE: Decline development is sampled if vein or potentially mineralized material is intercepted.

Methodology for sampling decline development material:

1) The geologist measures the distance from a reference point to locate the position from where the muck was taken. The reference points utilized at Fire Creek are either a ‘miner’s spad’, a hole in the rib used for mounting a hand-held laser distometer, or a spray paint line marker premeasured and labeled on the rib by the miners with SMD during the main decline and crosscut excavations. These reference points are surveyed;

2) The geologist spray paints a mark designating a five-foot sample interval on the rib face;

3) The geologist collects chips of the ribs with a rock hammer from a varying height above the floor to compensate for shot-crete or wire mesh. The chips fall into a clean bucket and are transferred to a bag. Bags are labeled as material is transferred to them;

NOTE: In some cases, the geologist pre-labels the bags in a sequence, 1, 2, 3, 4, or pre-labels the bags with SampleIDs taken from the central Excel spreadsheet. Sample numbers from older sample sets were from sample booklets. These older samples were six digit numbers with an Alpha-suffix of R, F, LR, or RR for rib, face, left rib or right rib. Details of the sample, such as to-from distance, geologic description, geologist, etc., were recorded in the sample booklets as the samples were collected.

4) The geologist takes the bagged samples to the geology office and hand enters the data into a central Excel spreadsheet including sample ID, location, date, geologist name, sample widths, and a geologic description of the sample;

NOTE: The location of the Decline Development samples are derived in the same manner as the face samples, itemized above.

5) Decline samples are usually delivered to the assay lab in Elko the day they are taken. No QAQC samples were included with these samples; and

6) Channel samples are not tracked. Sample status is derived from checking assay results and assay certificate on the company server.

Klondex staff at Fire Creek demonstrate knowledge about the channel and decline sampling and the corresponding digital data. Methods implemented at Fire Creek for management of the sample data are inadequate; however, results are sufficient to be used in the mineral resource estimate.

11 Sample Preparation, Analyses, and Security

11.1 Historic Sample Preparation

Historical sampling methodology was previously documented (Raven et al., 2011), and is summarized below.

"Rotary cuttings are analyzed in 10-foot (3.05 metre) increments over the entire drilled interval including unmineralized rock above the vein zones. Samples in the rotary holes are collected at 5 foot (1.52 metre) intervals but assayed as 10 foot (3.05 metre) composites. The hole was blown clean between the sample intervals to avoid sample contamination. During the 2004 drilling period, cuttings were collected via a cyclone that dumped into a rotating splitter mounted on the drill. The baffles were adjusted to recover a one-quarter split of the total recovered sample. More recently the 10-foot (3.05 metre) runs of cuttings have been caught in a large bucket and thoroughly mixed by hand before collecting a sample. The approximately 20 pound (9.1 kilogram) samples are placed in canvas bags and labeled with the hole number and footage. A backup sample remains on site until assaying is complete and is then discarded. The samples are picked up by ALS/Chemex for preparation at their Elko facility.

"Below the RC precollar boring, HQ size core is drilled and collected in 10 foot (3.05 metre) paper core boxes. Intervals are marked with wooden blocks every 2 to 3 feet (0.6-0.9 metres). The core is logged on site by a MinQuest geologist who marks sample intervals not to exceed 5 feet (1.52 metres). In some vein areas, where possible visible gold is observed, the sample interval is reduced to two feet (0.6 metres). The logged and marked core is transported from the project site by the geologist to secure storage in Battle Mountain. Under the supervision of a project geologist the core is transported to Elko and split in half using a core saw by Klondex employees. One-half of the core is sampled on the intervals marked by the geologist, placed in canvas bags, labeled with the hole number and footage and sent to the lab for preparation and analysis as described below. The remaining one-half core is transported to Klondex's secure storage in Reno. The sample intervals are listed on the drill logs and assay sheets. Author Raven observed numerous intervals of split core, all of which were cleanly sawn in half and appear to evenly represent the vein systems and the sample intervals are clearly marked within the core boxes. The sample quality is of industry standard and the methods should not introduce any bias into the results. The sampling intervals are determined mainly by the presence/absence of quartz-calcite-pyrite veins or vein stockworks. The barren, upper portions of many holes are not sampled. When veining is encountered a broad interval above and below the veins is sampled and the vein zone itself is sampled at intervals of 2.0-5.0 feet (0.6-1.52 metres); discrete veins of reasonable size are sampled over the length of the vein while stockwork zones are generally sampled at 5 foot (1.52 metre) core lengths." (Page 23)



11.2 Current Sample Preparation

11.2.1 Core Sample Preparation

The following outlines the drilled material sample preparation.

1) A Klondex geotechnician (geotech) splits core in a mobile cargo container next to the core logging facility. The core boxes are lifted onto a rolling counter to the left of the splitter. The splitter is in front of the geotech. A cloth sample bag is placed on the floor at the feet of the technician for the prepped sample material;

2) Sample bags are labeled using black magic marker according to the cut sheet. This may occur either in the office or at the splitting facility;

NOTE: It is possible for empty pre-labeled sample bags to be out of order prior to being filled or a numeric value to be omitted during hand-writing.

3) The Geotech splits core to approximate 50% of the sample bisecting veins equally. Splitting samples that contain visible gold (VG) are supervised by the geologist;

4) The left half of the split is returned to the core box, the right is dropped into the sample bag;

5) When the sample interval has been bagged, the sample bag is stacked in numeric order on the floor by the door;

6) QAQC samples are bagged and labeled by geologists from standards kept in a locked cabinet in the Geology office. The geologists assemble the standards and blanks into corresponding sample bags which are hand-labeled according to the cut sheet.

7) When an entire drill hole has been completely split, the bags of sample are stacked inside a large, open, plastic bin outside the core facility. The entire bin of samples is picked up and delivered to ALS by the ALS driver;

8) When the driver from ALS arrives at the core logging facility, he is given the QAQC samples to accompany the samples from the corresponding drill hole;

9) The reserved halves of core are kept in core boxes and are stored outside on pallets in a lay down area referred to as the ‘Mud Yard’. The lids of core boxes are secured with straps;

10) The geotech notifies the geologist when a hole is ready to be sent to ALS; and

11) An electronic sample submittal sheet is entered into the computer. Two copies are made, one is the original hand-entered submittal, and the other is a scan of the completed submittal. One copy is filed in a core library, and the other is given to the truck driver for ALS.

11.2.2 Channel and Decline Sample Preparation

The following outlines the channel and sample preparation methodology.

1) Channel samples are bagged on site at the face or rib;
2) Bags are brought to the Geology office;
3) QAQC materials are inserted into the channel sample dispatch; and
4) Channel samples are delivered to SGS every twelve-hour shift.

11.3 Sample Analysis Protocol

11.3.1 Core Sample Analysis

Historical analyses for gold used a 50 gram pulp sample through to the end of 2009. In 2010, Klondex changed to a 30 gram pulp sample for gold analysis. The current sampling analysis protocol is similar to the historical methodology, as previously described in Raven et al., 2011:

"ALS/Chemex does all sample preparation, including crushing, grinding and preparation of the assay pulps, at the Elko facility. The pulp samples are then shipped to the ALS/Chemex facility in Reno for analysis. The samples are never left unattended or insecure by geologic, drilling, or laboratory staff nor are they handled by officers, directors or associates of Klondex. For the RC pre-collar holes ALS/Chemex picks up the samples at the project site and delivers them to Elko for sample prep and to Reno for analysis. After the core samples are cut and labeled for analysis they are delivered to the lab by Klondex employees. (Page 25)

"Sample preparation involves crushing the entire sample to -10 mesh, splitting, then pulverizing 1,000 grams to 80% passing -200 mesh (75 microns). These pulps are shipped to the Reno facility of ALS/Chemex for analysis. Analyses for gold were done using a 50 gram charge through to the end of 2009. In 2010 Klondex changed to a 30 gram charge for gold analysis after reviewing the data. Both gold and silver analyses are done by fire assay with an AA finish. The ALS/Chemex analyses codes are AA23 for gold values under 10 g/t and GRA (gravimetric) for gold assays over 10 g/t; silver codes are AA61 with over limits run using AA62. (Page 25)

"The assay laboratory automatically repeated all gold assays that by fire assay with AA finishing reported > 1 g/t, using 50 grams prior to late 2010, then 30 grams fire assaying

subsequently. Any samples reporting >10 g/t gold by fire assay with AA finish are automatically subjected to gravimetric analysis." (Page 25)

"When the lab work is complete, the pulps are stored briefly at the lab then transferred to Klondex's secure storage facility, the same facility that houses the drill core. Coarse rejects that reported significant gold are stored with the pulps, those reporting minimal gold are stored until check assays can be completed and are then discarded and those reporting insignificant gold are discarded.

"Until late 2010, Klondex did not employ a QA/QC program. Prior to that time, the only QA reporting was derived from the commercial laboratory's internal QA programs that included internal blanks and standards, and automatic re-assays of pulps in which the gold grades exceeded 1 g/t. In addition a significant number of samples were sent to a different laboratory for check analysis. Subsequently Klondex has initiated its own internal quality control procedures. Presently Klondex has prepared blank samples using post-mineral basalt core from well above the mineralized zones. In addition two standards were prepared (low and medium grade) by ALS from Fire Creek assay rejects and there have now been enough analyses of the standards to determine their average grade and standard deviation. Since these "standards" were not subjected to multiple assaying by ALS to report the laboratory's mean and standard deviations, the determination of the statistical quality of these standards has derived solely from a modest population of standards that have been submitted by Klondex in the ongoing drilling program." (Page 25).

11.3.2 Channel Sample Analysis

Channel samples are currently sent to SGS North America, Inc. in Elko, Nevada. Between April and June 2013, rib and face samples followed the following protocol:

- Sample material is weighed, dried, a portion weighing less than three kg is crushed to 75% passing through a two mm screen. Material is split down to 250 g, pulverized to 85% passing through a 75 micron screen;
- QC is performed at the crush and pulverization stages;
- Ag is analyzed by AAS methods after a multi-acid digest at a weight of 2 g;
- Ag is analyzed by FAS and gravimetric finish at a weight of 30 g (the reported code is F 152); and

- Au is analyzed by FAS and gravimetric finish at a weight of 50 g (the reported code is F 133).

In June 2013, the split was increased to 1,000 g, and the initial fire assay aliquot was increased to 500 g. Rejects for April through June were sent to SGS's Vancouver office for metallic screen assays. Results for these assays were incomplete and are not used in the mineral resource model.

11.3.3 Handling Analyses Results

1) ALS sends the assay results and certificates by email to three people: Chief Geologist, Sr. Geologist, and Geology Database Administrator;

2) Assay results from ALS are stored as portable document formats (PDF) on the Klondex server in a hierarchy of folders with a naming convention based on source of drilled material, including channel samples, UG, surface core, surface RC, screen filter sampling, truck load samples, rib sampling, muck piles, waste piles, and resamples of these same sources. This folder system is rudimentary and not user-protected;

3) The PDF and comma separated values (CSV) files from ALS are renamed to add the BHID for identification and for ease in referencing;

4) The CSV files are also stored in the same hierarchy of folders as listed above;

5) Excel files for use by mine modeling software, such as Datamine, are updated as to lithology, assay results and other edits, by means of copy and paste from the reported CSV files into the master files;

NOTE: There are no conversions made, such as from parts per billion [ppb] to parts per million [ppm].

6) CSV files undergo extensive manual manipulation and editing. Dashes in the drill hole name are removed. The status of editing to the header files and assay results, and other edits to clean the data, are recognized with removal of the dashes from the BHID. These are cumbersome, labor-intensive edits. A new database is planned to manage these datasets more efficiently; and

7) Fire Creek has an internet connection that is unreliable. There is no Systems Administrator to plan for or implement an enterprise system for data management, or virtual private network (VPN) connection between the Project and Elko office servers. An enterprise system would create a secure, user-password protected connection for immediate communication and for automated backups. At this time, data is transported

on external hard drives between the project site and the Elko offices as a result of unreliable internet access.

11.4 Sample Security Measures

The storage of the drilled material is currently unsecured during the multiple stages of core handling. Core boxes are either stored on pallets outside of the logging facility or on pallets with straps over the lids in a core yard. Pallets are covered with ultraviolet light (UV) resistant plastic shrink-wrap. A new core storage facility has been proposed which would greatly enhance the integrity of Fire Creek's drilled material over time.

Figure 11-1 Core Logging Facility (January 2013)



11.5 Quality Control Measures

Historically, QAQC measures used to check the consistency in assay reporting was either lacking or was not included in any surviving reports. Beginning in March 2004 through the second quarter of 2012, Klondex samples were submitted to ALS and were reliant solely on the laboratory's in-house QAQC to monitor the sampling results. The current procedure of inserting field duplicates, blanks, and standards began in the second quarter of 2013 when Klondex began processing core on site. Prior to this time, core was transported to Reno for cutting and sampling, and any QAQC measures were directed by MinQuest in Reno.

From March 2004 through February 2012, ALS's QAQC checks on the Fire Creek samples included 12,465 in-house standard samples and 11,201 re-assays of the immediately previous

sample inserted into the Klondex sample runs as part of their protocols. Also, beginning in August 2010 through February 2013, ALS completed 1,264 duplicates derived from pulp of the prepared sample for Fire Creek sample runs. Recently, ALS sent a summary of their in-house QAQC sample results to Klondex as part of recording QAQC documentation. Their report combines sample results from both surface and underground drilling.

From the second quarter of 2012 through January 2013, Klondex submitted 152 of their own standards and blanks and 39 duplicate samples to ALS. From August 2012 until May 2013, Klondex submitted 193 of their own standards and blanks and 77 duplicate samples to ALS.

The populations of datasets for QAQC sampling are itemized in the Table 11-1 below.

Table 11-1 QAQC Datasets Reviewed

Datasets:	ALS internal QC standards (March 2004 - Feb. 2013)	ALS internal QC dups (March 2004 - Feb. 2013)	ALS internal QC prep-dups (Aug. 2010 - Feb. 2013)	SRM Au and Ag standards (Nov. 2010)	Klondex standards*1	Klondex duplicates*2
UG Core	mixed surf+ug	mixed surf+ug	mixed surf+ug	0	193	77
Surface RC/core	mixed surf+ug	mixed surf+ug	mixed surf+ug	94	152	39
Totals	12465	11201	1264	94	345	116
*Surface standards and dups dates: June 2012 - Jan. 2013						
*UG standards and dups dates: August 2012 - May 2013						

Klondex's current QAQC protocol at Fire Creek is summarized as follows:

- Klondex staff inserts a blank in the first position of samples from a core hole;
- Staff inserts one of three types of QAQC standards every 20 samples. The three standards are 1) blank, 2) standard, or 3) duplicate;
- The blank is crushed, homogenous barren material (one blank standard is reduced, one is oxidized) and labeled as follows:

FCRDBLNK01= <0.005 ppm Au (reduced);

FCOXBLNK01= <0.005 ppm Au (oxidized), and;

AUBLANK54 = <0.002.

- For the duplicate sampling, Klondex submits an empty bag labeled with the required sample ID in sequence. The lab will then re-run the immediate previous sample in the drill core; and

- Klondex produces specific QAQC standards derived from low-grade, reduced basalt, which is crushed, and from pulverized sample standards in packets from ROCKLABS as follows:

FCRDLOW01 1.246 ppm Au

OXQ90 24.88 ppm Au

OXP91 14.82 ppm Au

OXN92 7.643 ppm Au

SG56 1.027 ppm Au

SN60 8.596 ppm Au

SP59 18.12 ppm Au

SQ48 30.25 ppm Au

SQ83 30.64 ppm Au

SQ70 39.62 ppm Au, 159.5 ppm Ag

Klondex has mandated that ALS follow a separate protocol for samples between one ppm Au and ten ppm Au, determined by Atomic Absorption fire assay fusion analytical method (AA23). These samples are run as a duplicate. A sample greater than ten ppm Au is re-assayed by ALS with gravimetric finish. For VG samples, Klondex submits samples to ALS for a metallic screen fire assay. Also, if the assay results are very high grade (greater than 20 ppm Au), then ALS will re-assay the coarse rejects by metallic screen fire assay. For all re-assays by metallic screen fire, Klondex requests two sample ‘shoulders’ on either side of the sample(s).

11.5.1 Duplicates Performance

Duplicate assays analyzed between August 2012 and January 2014 show good correlation with tight tolerances for the 39 surface and 77 underground core samples. The results of these duplicate programs are shown in Figure 11-2 through Figure 11-5.

Figure 11-2 Surface Duplicate Au Assays (May 2012 – January 2014)

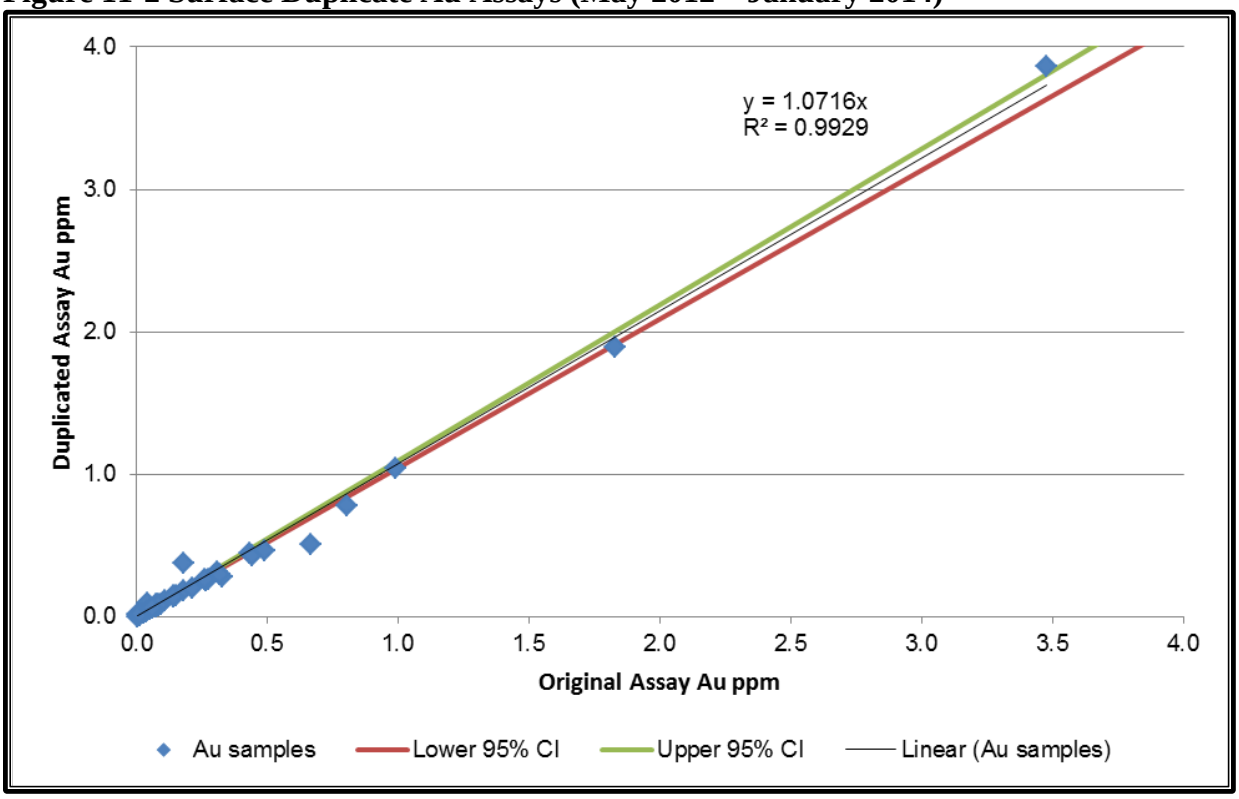


Figure 11-3 Surface Duplicate Ag Assays (May 2012 – January 2014)

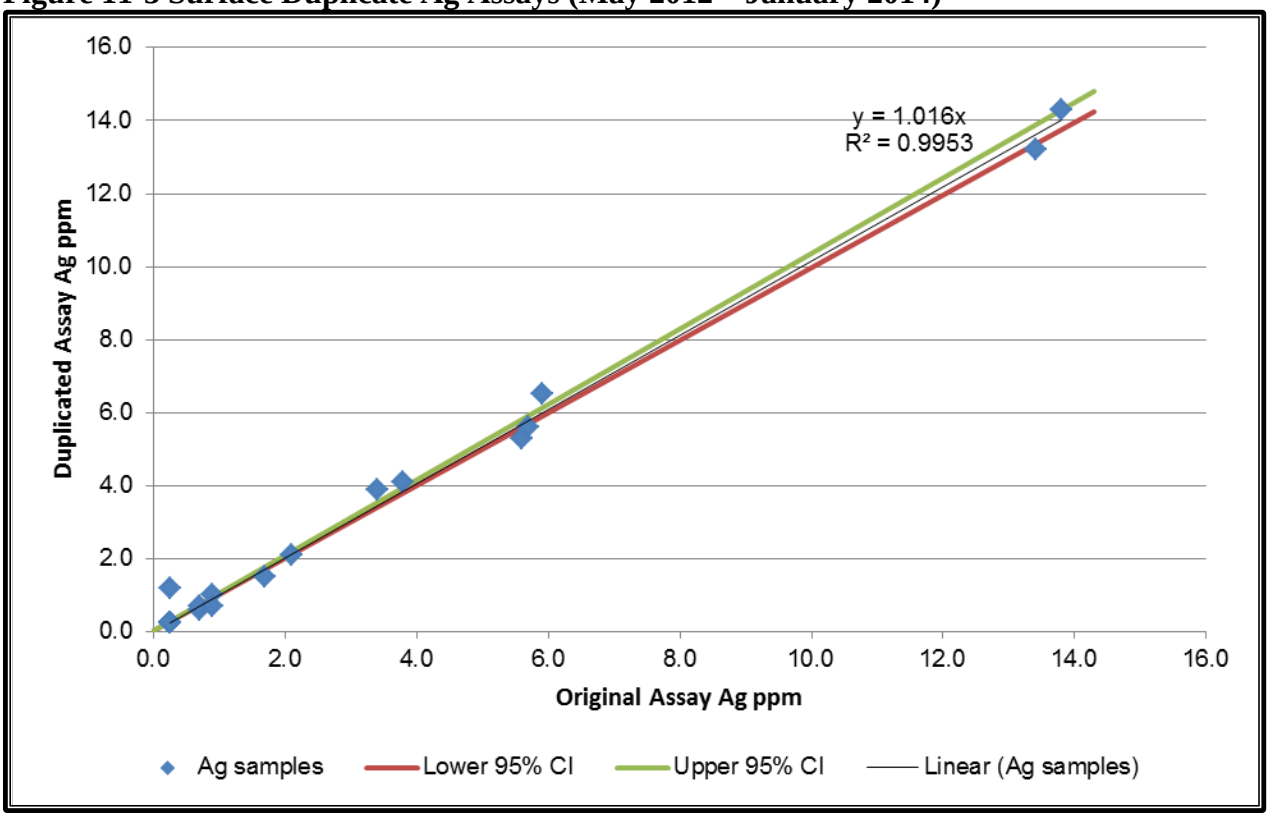


Figure 11-4 Underground Duplicate Au Assays (August 2012 – January 2014)

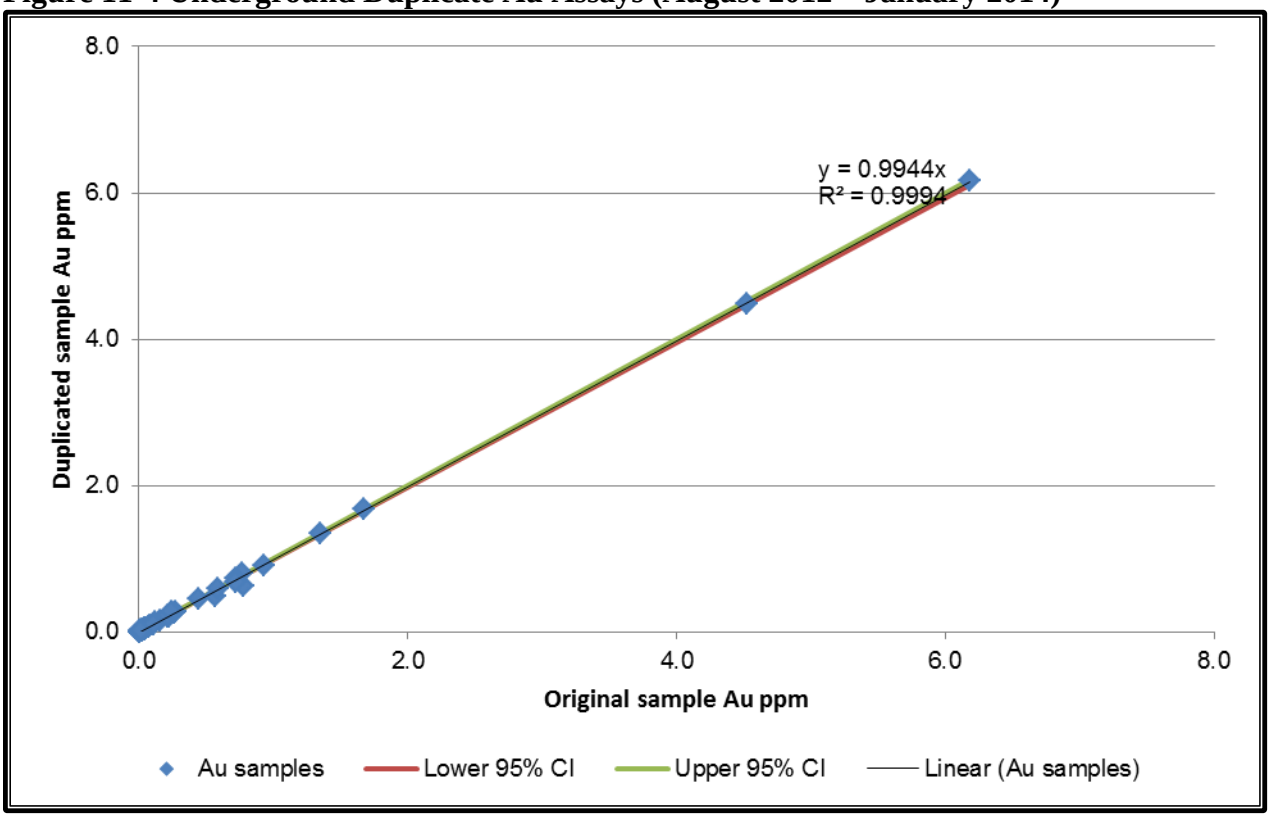
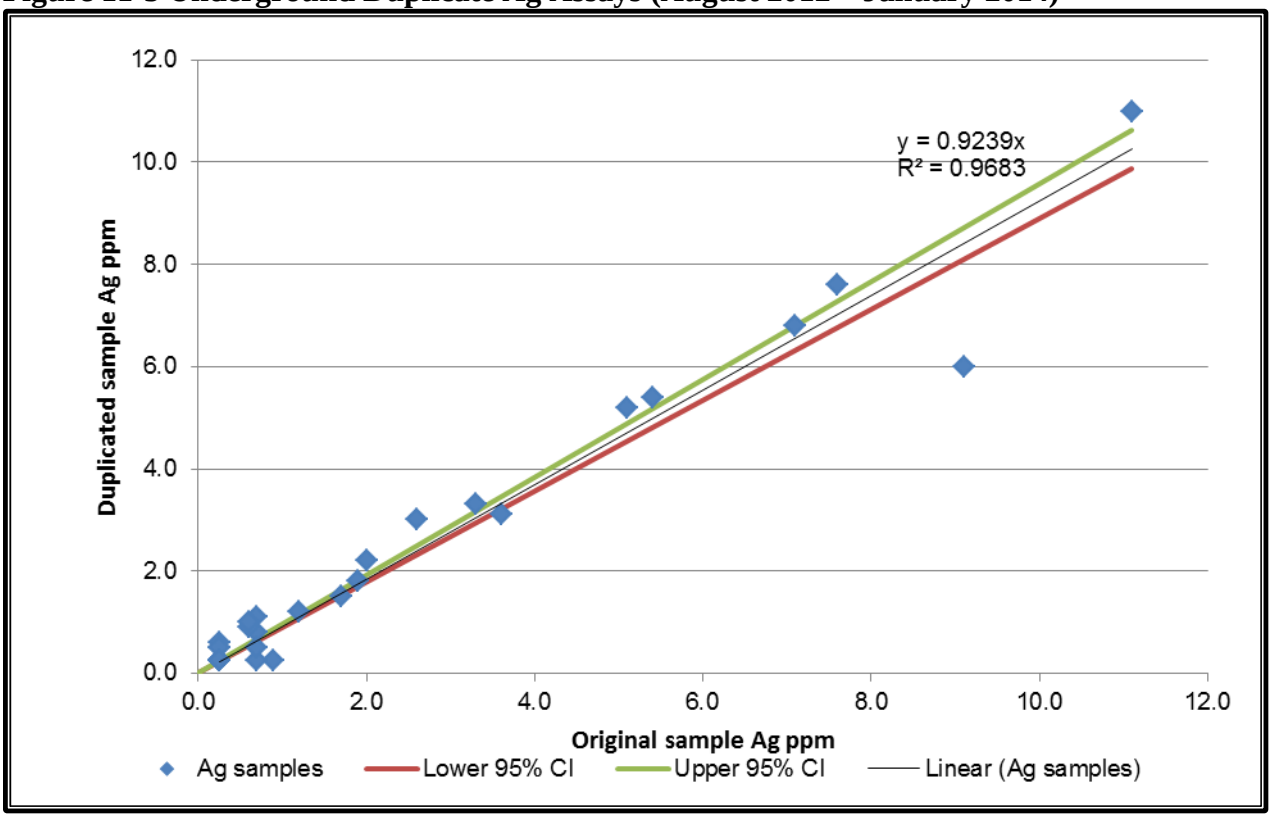


Figure 11-5 Underground Duplicate Ag Assays (August 2012 – January 2014)



11.5.2 Blank Assay Performance

Figure 11-6 shows the results from the ALS lab of the 38 samples from a population tested between June 2012 and January 2014 of FCOXBLNK01, Klondex QAQC blank, which were reviewed by the authors for the surface core drilling program. There were two outliers (sample ID 803930 from drill hole FC12020 with a value of 0.859 Au ppm, and sample ID 804201 from drill hole FC12021 with a value of 0.131 Au ppm), which were removed from this analysis for the sake of evaluating a bias. In the remainder of the blank sample results, there were nine outliers (about 25%) with values between 0.006 and 0.016 Au ppm, the higher values of which could indicate a trace of contamination in the sample batches. It is unknown to the authors if the subsequent samples were re-run as a result of these anomalous sample results.

Figure 11-6 Klondex Blank FCOXBLNK01 Results (June 2012 – January 2014)

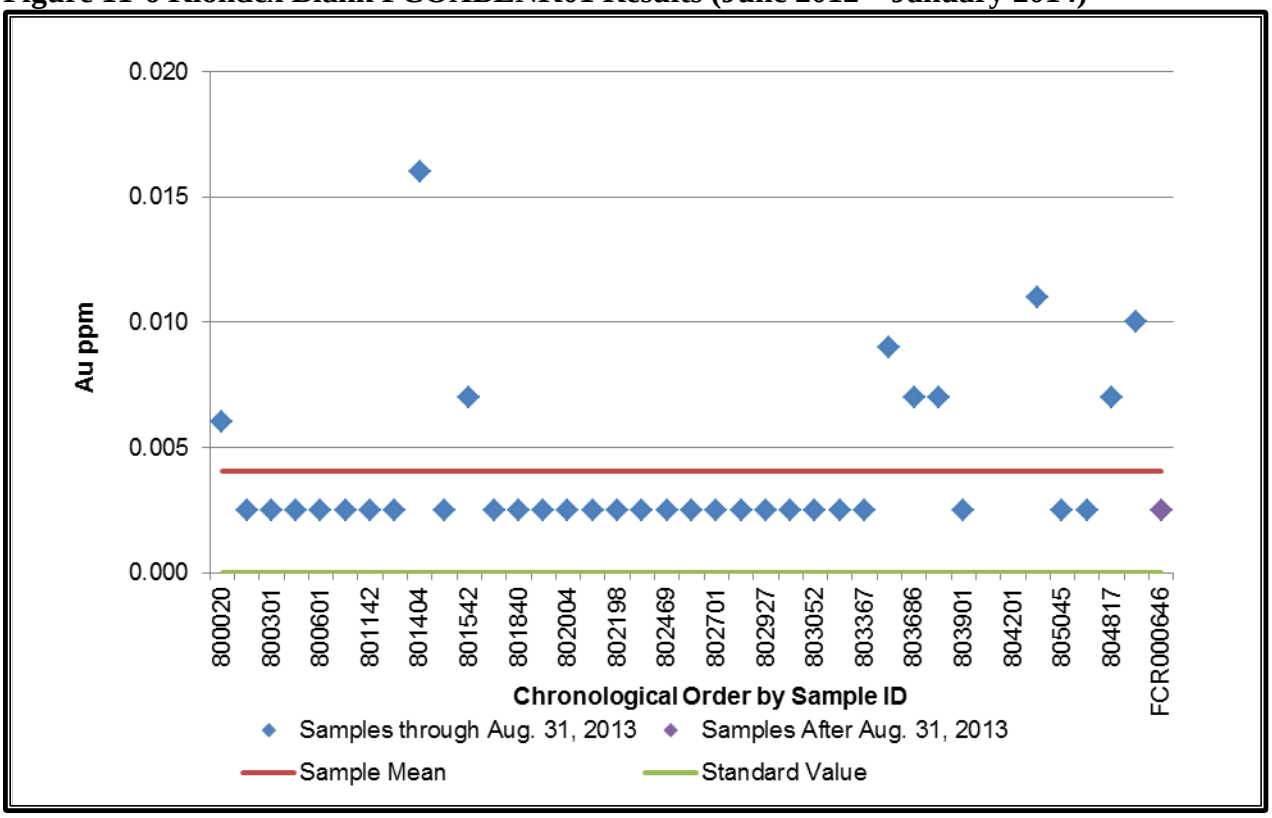
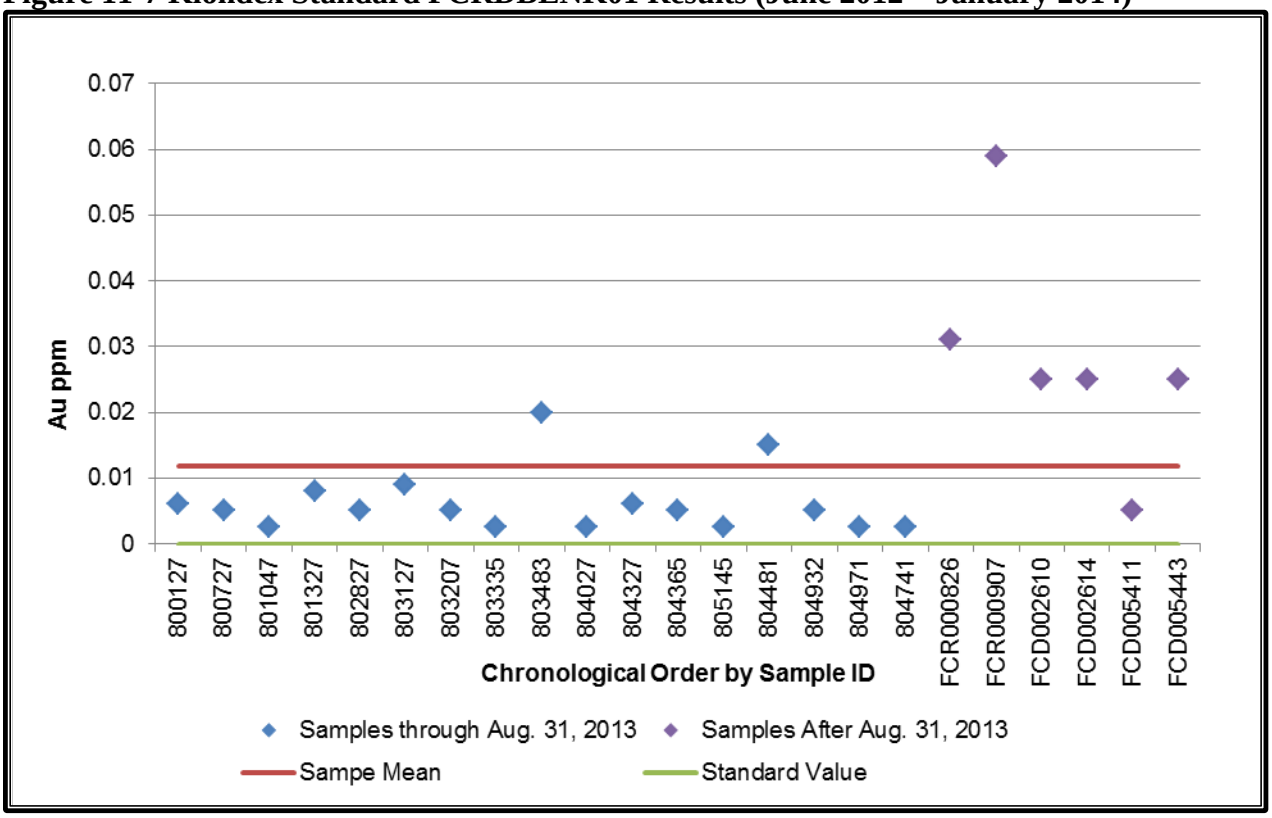


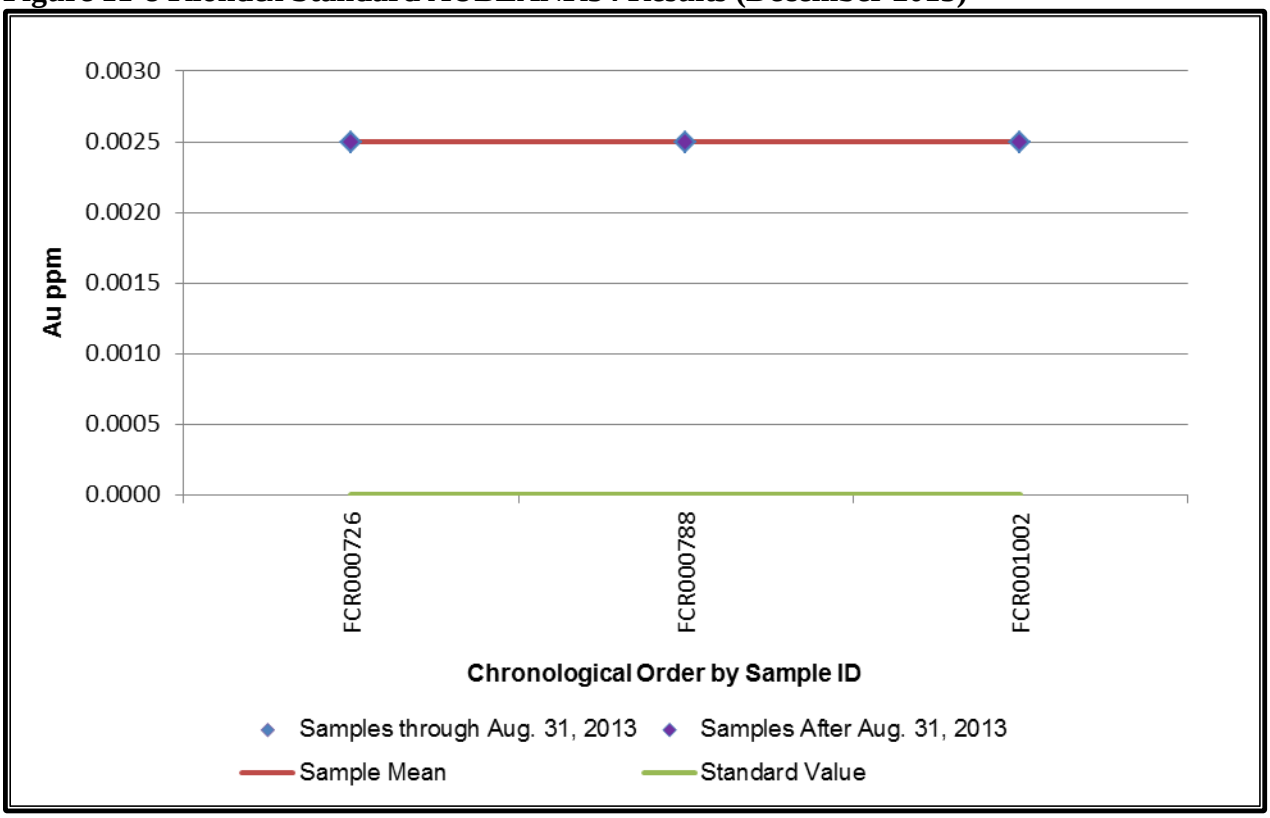
Figure 11-7 shows the results from the ALS lab of 17 samples of FCRDBLNK01, Klondex QAQC blank, which were reviewed by the authors for the surface core drilling program from a population of samples taken between June 2012 and January 2014. There were two outliers with a slightly dispersed population, and overall the other blank samples were within accepted statistical means.

Figure 11-7 Klondex Standard FCRDBLNK01 Results (June 2012 – January 2014)



Assay blank results for Klondex standard AUBLANK54 are shown in Figure 11-8. There are only three assays of this standard and all indicate the samples were below the detection limit.

Figure 11-8 Klondex Standard AUBLANK54 Results (December 2013)



Statistical analysis of the means from both blank sample sets are presented in Table 11-2. Using the one tail T-statistic (meaning the result is expected to either be a positive number or zero), the results listed below are inconclusive in determining if the mean of the blank samples is zero. Results of the current analysis demonstrate either possible contamination, or values that are at the limits of practical detection by the assay method and, therefore, beyond detection limit.

Table 11-2 Assay Results for Blank Samples

Blank ID	Expected Value	Sample Mean	Sample Standard Deviation	Count	t Statistic	$t_{5\%}$	Result
FCOXBNK01	0.00	0.0040	0.003	37	7.832	-1.688	Detection Limit
FCRDBLNK01	0.00	0.0120	0.014	23	4.194	1.717	Possible Contamination
AuBLANK54	0.00	0.0025	0.000	3			Detection Limit

11.5.3 Standards Performance

Figure 11-9 shows the results from ALS of the 20 samples of FCRDLOW01, Klondex QAQC standard, which were reviewed by the authors for the surface core drilling program from a population of samples taken between July 2012 and January 2014. There was one outlier, and the remainder of the standard assay results fell within the predicted statistical mean.

Figure 11-9 Klondex Standard FCRDLOW01 Results (July 2012 – January 2014)

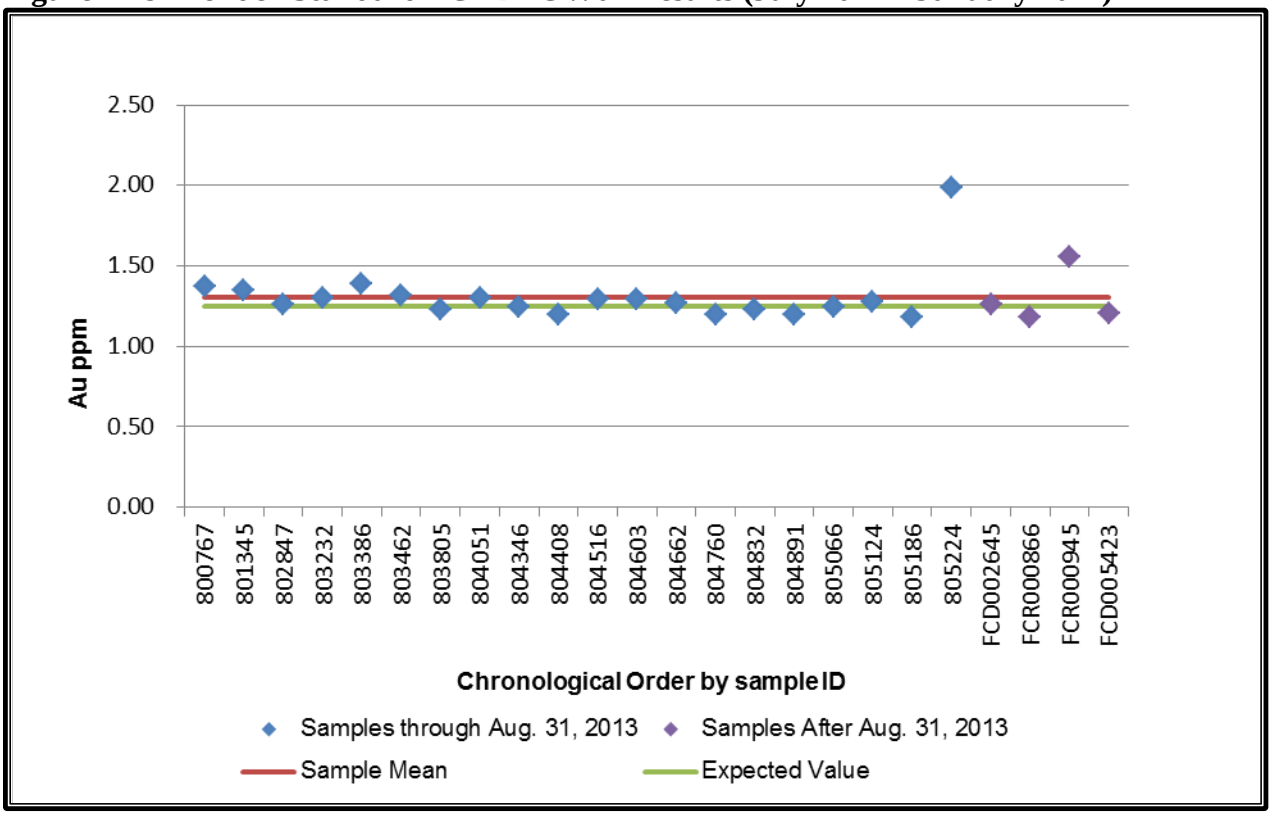


Figure 11-10 shows the results from ALS of the seven samples of OXQ90, Klondex QAQC standard, which were reviewed by the authors for the surface core drilling program from a population of samples taken between September 2012 and January 2014. There was one outlier, and the remainder of the standard assay results fell below the expected statistical mean, with a trend indicating a possible bias toward the low-end of detection. The authors would recommend further analysis of this standard by cross checking the results with an independent laboratory.

Figure 11-10 Klondex Standard OXQ90 Results (September 2012 – January 2014).

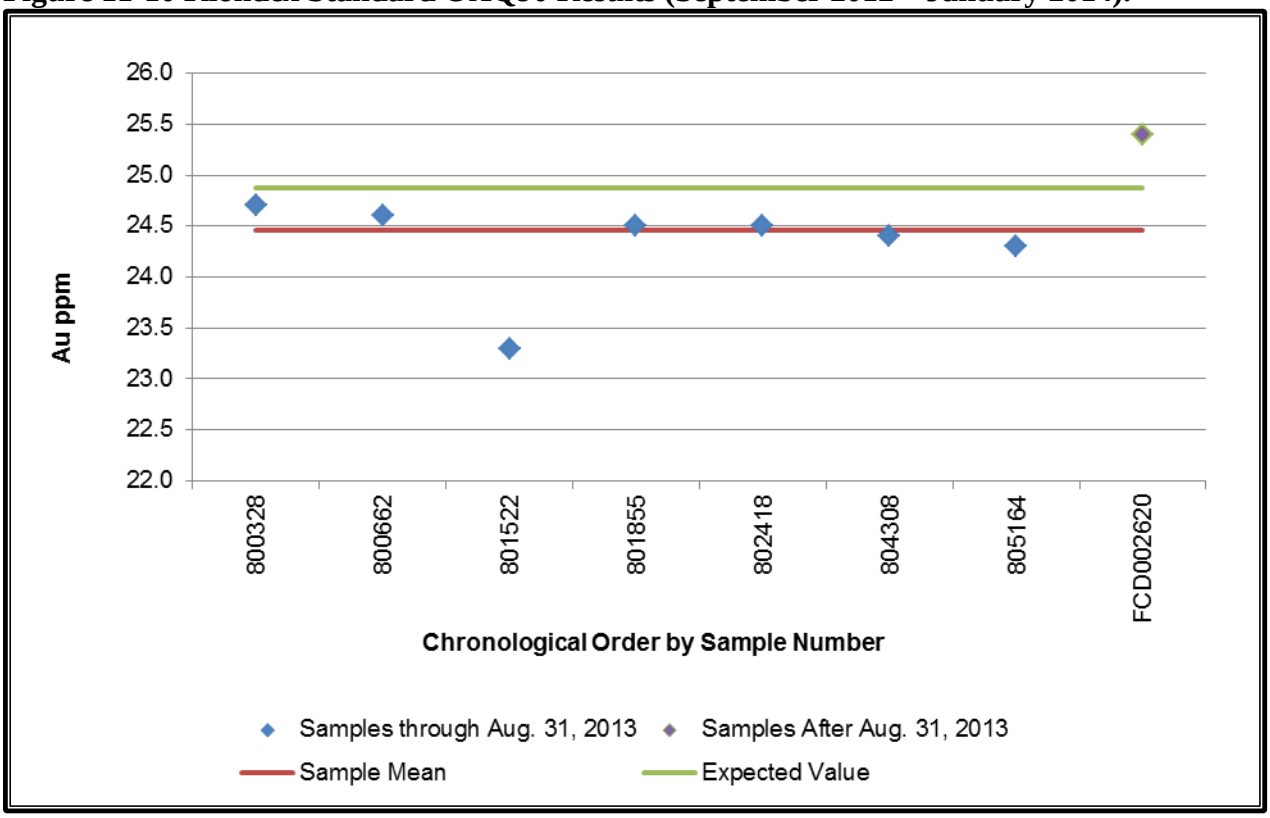


Figure 11-11 shows the results from ALS of ten samples of OXP91, Klondex QAQC standard, which were reviewed by the authors for the surface core drilling program from a population of samples taken between March 2012 and January 2014. There was one outlier, with most of the other standard assay results returning slightly below the predicted standard value.

Figure 11-11 Klondex Standard OXP91 Results (March 2012 – January 2014)

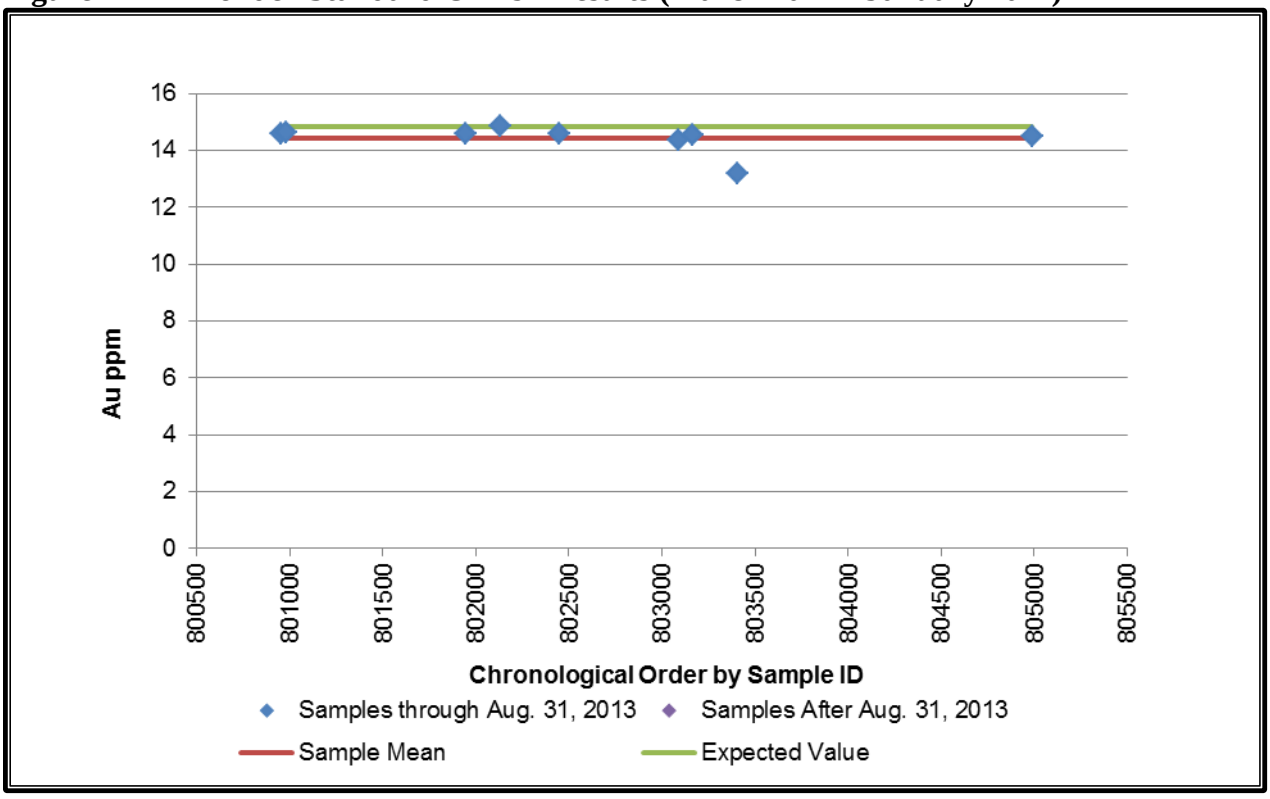


Figure 11-12 shows the results from ALS of eight samples of OXN92, Klondex QAQC standard, which were reviewed by the authors for the surface core drilling program from a population of samples taken between June 2012 and January 2014. There was one outlier, and the majority of the other standard assay results appear to be below the expected statistical mean. The authors would recommend further analysis and cross-checking results with an independent laboratory.

Figure 11-12 Klondex Standard OXN92 Results (June 2012 – January 2014)

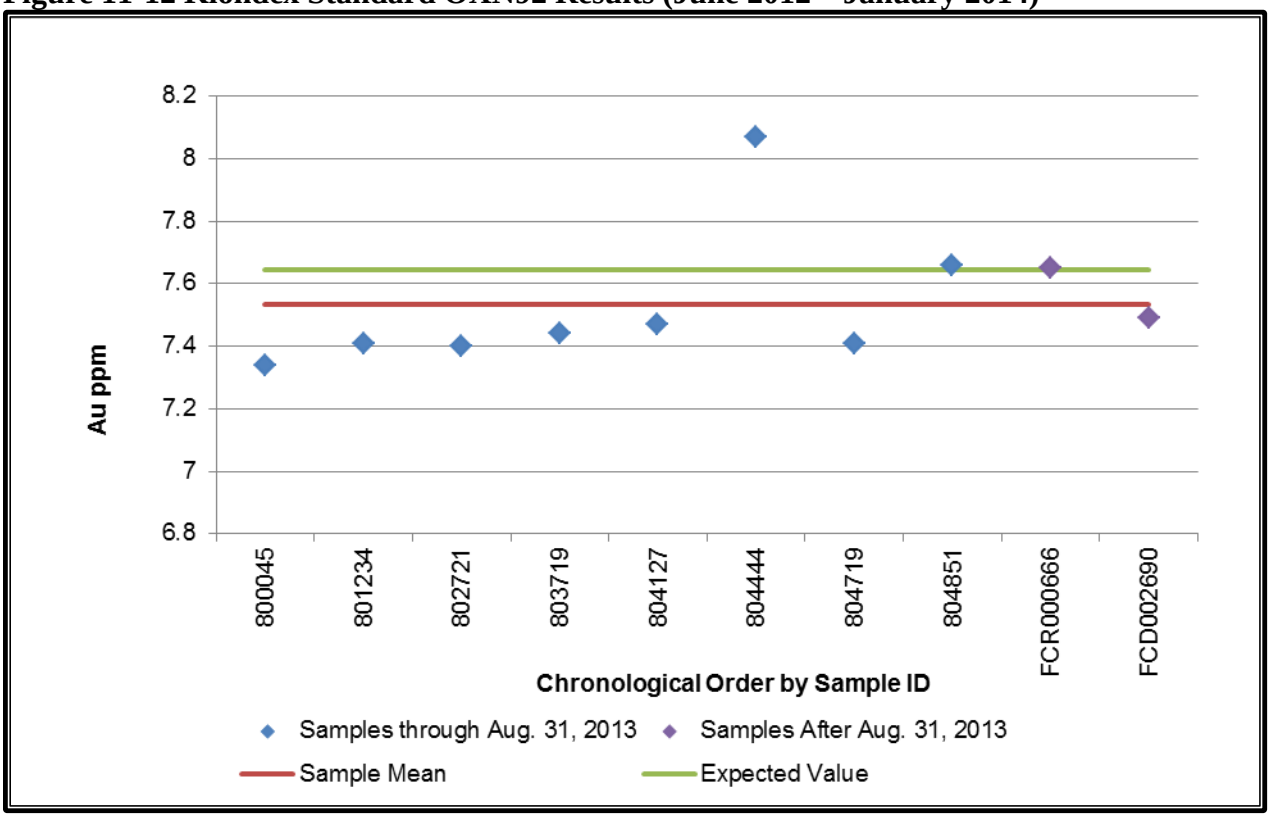


Figure 11-13 shows the results from ALS of 18 samples of SG56, Klondex QAQC standard, which were reviewed by the authors for the surface core-drilling program from a population of samples taken between June 2012 and January 2014. There were two outliers, and the remainder of the other samples for this standard correlated well with the predicted value.

Figure 11-13 Klondex Standard SG56 Results (June 2012 – January 2014)

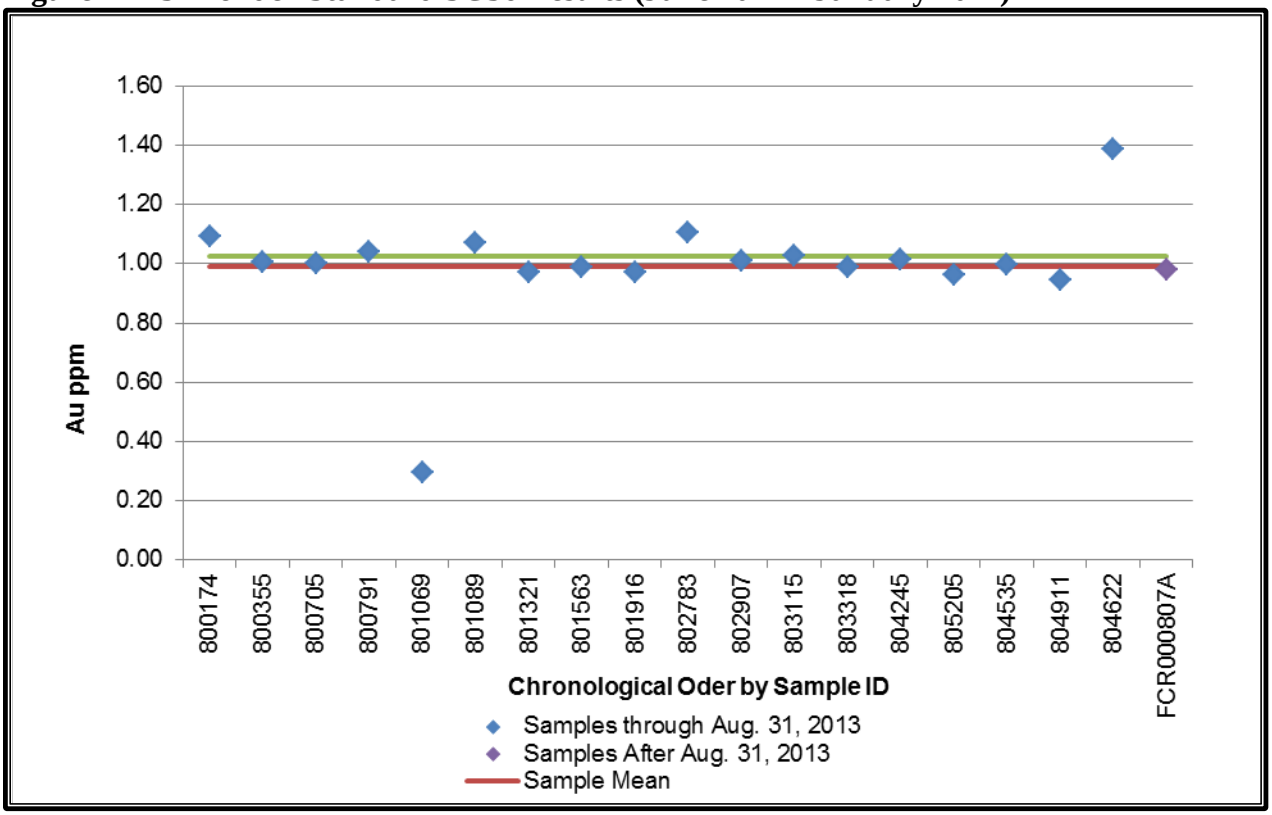


Figure 11-14 shows the results from ALS of 13 samples of SN60, Klondex QAQC standard, which were reviewed by the authors for the surface core-drilling program from a population of samples taken between June 2012 and January 2014. There was one outlier, and the remainder of the samples were within acceptable limits.

Figure 11-14 Klondex Standard SN60 Results (June 2012 – January 2014)

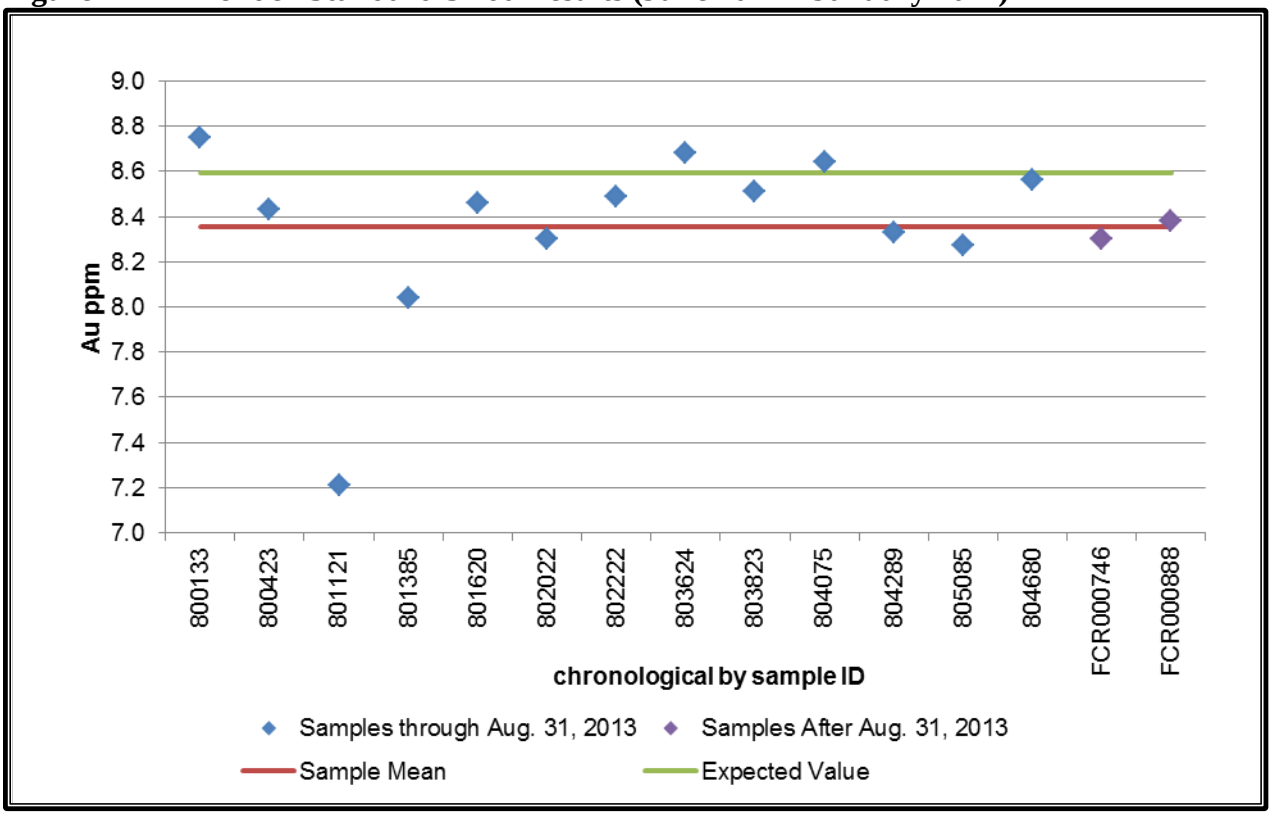


Figure 11-15 shows the results from ALS of nine samples of SP59, Klondex QAQC standard, which were reviewed by the authors for the surface core drilling program from a population of samples taken between August 2012 and January 2014. The samples were not within statistical limits, and the results underestimated the expected value. The authors recommend further testing and cross checking the results with an independent laboratory.

Figure 11-15 Klondex Standard SP59 Results (August 2012 – January 2014)

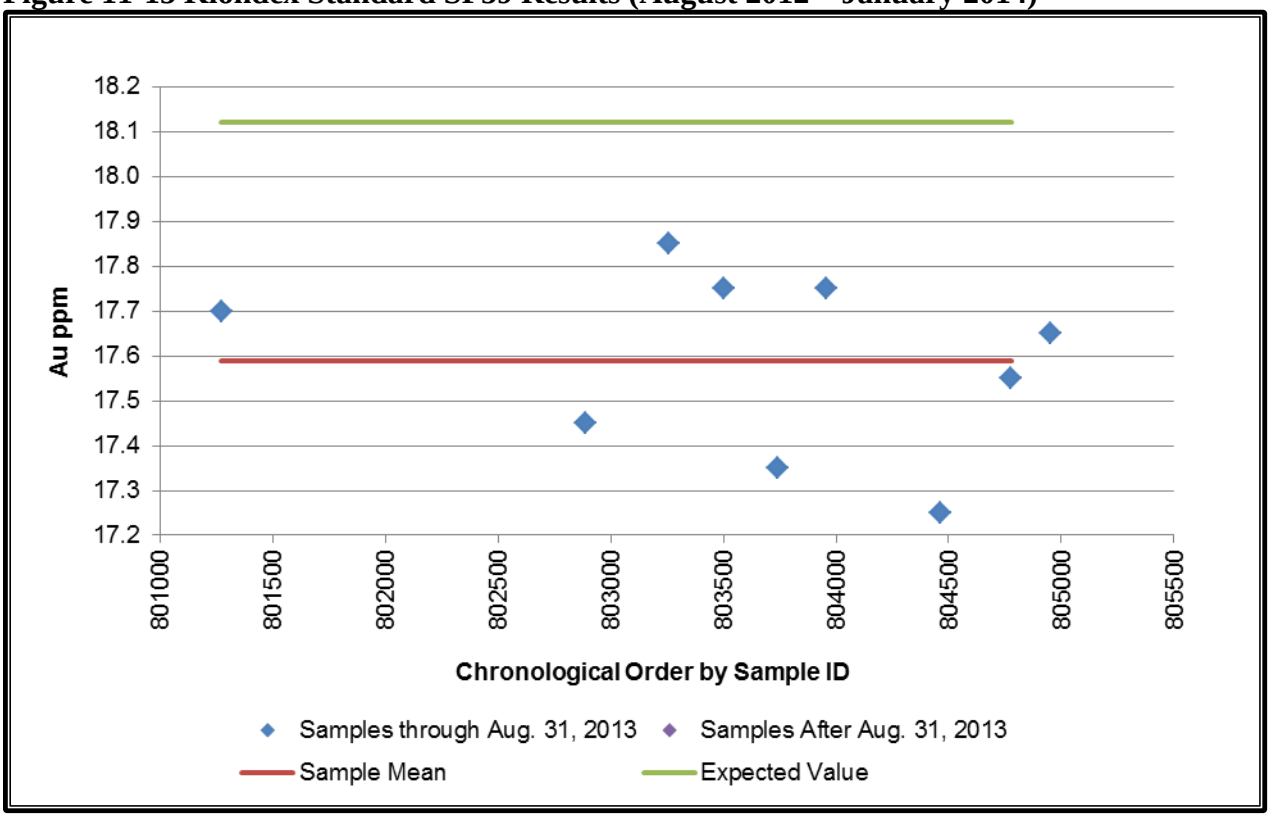
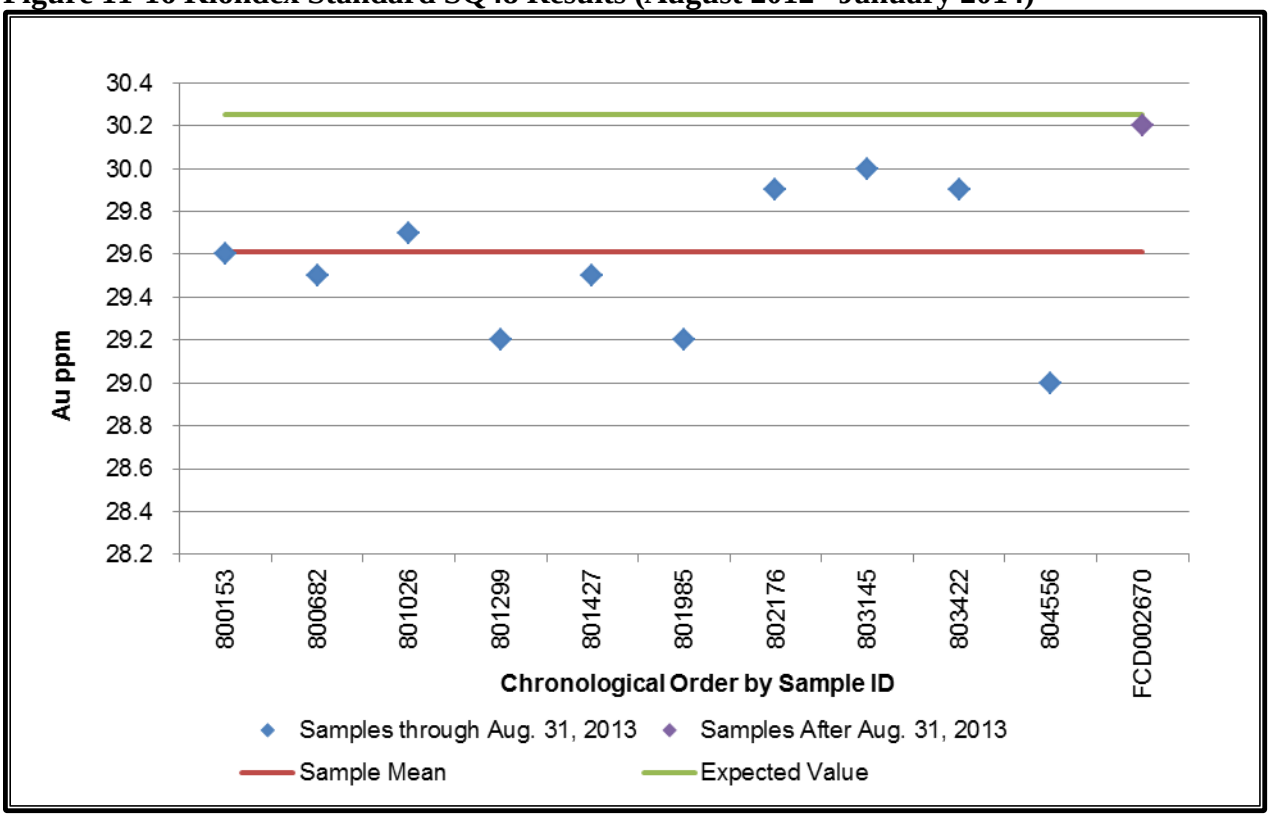


Figure 11-16 shows the results from ALS of nine samples of SQ48, Klondex QAQC standard, which were reviewed by the authors for the surface core drilling program from a population of samples taken between August 2012 and January 2014. The samples were broadly dispersed and below the expected standard value. The authors would recommend further analysis of this standard and cross checking with an independent laboratory.

Figure 11-16 Klondex Standard SQ48 Results (August 2012 –January 2014)



Statistical analysis of the standard assay samples are presented in Table 11-3, below. The mean values for four out of eight standards correlate well with the expected value. The mean sample values for the four highest grade standards all underestimated the standard values, which could indicate a low bias in the high grade samples.

Table 11-3 Assay Results for Standard Samples

Standard ID	Expected Value	Sample Mean	Sample Standard Deviation	Count	t Statistic	$t_{5\%}$	Result
FCRDLOW01	1.246	1.306	0.166	24	1.755	-0.021	Accept
OXQ90	24.88	24.46	0.578	8	-2.043	-2.365	Accept
0XP91	14.82	14.43	0.481	9	-2.412	-2.306	Inconclusive
OXNP92	7.64	7.534	0.215	10	-1.600	-2.262	Accept
SG56	1.03	0.993	0.195	19	-0.765	-2.101	Accept
SN60	8.60	8.357	0.365	15	-2.537	-2.145	Inconclusive
SP59	18.12	17.59	0.203	9	-7.858	-2.306	Inconclusive
SQ48	30.25	29.609	0.375	11	-5.663	-2.228	Inconclusive
SQ83	30.64	30.100	0.707	2	-1.080	-12.706	Accept

11.6 Opinion on the Adequacy of the Sampling Methodologies

Klondex staff at Fire Creek have shown a solid understanding with regard to management of the drilled core and associated digital data. The methods of handling the drilled material, both physically and electronically, are acceptable for use in an initial analysis of the potential mineral resource; however, there exist system improvements that should be implemented in the future, as the Project develops.

11.6.1 Sampling Protocol Issues

Drilled materials storage at Fire Creek needs improvement to ensure sampling integrity is maintained. Construction of a new facility for core storage, logging and long-term maintenance would alleviate this issue.

The electronic data is rudimentarily compiled in a series of Excel spreadsheets (database). This is acceptable for use as an initial analysis of the mineral resource; however, the method of storing and editing Excel spreadsheets is susceptible to multiple errors throughout the data management process. In particular, the FROM-TO intervals contain overlap errors, and raw data is cut and pasted by hand into non-secure spreadsheets.

Klondex has plans to implement two software systems: DataShed and AcQuire in 2014. These software systems will address all data management issues.



There is no Systems Administrator to plan or implement an enterprise system solution for data management linking servers through VPN connection and implementing a user-protected access to folders.

At this point, the database contains multiple errors but is not considered unusable if errors are noted and edits are performed. As of the date of this report, a direct assay certificate-to-spreadsheet-values audit has upheld the integrity of the spreadsheet data for a reliable mineral resource estimate for preparation of this Technical Report.

11.6.2 **Standards and Blanks Performance Issues**

The blank data collected and used by Klondex (FCOXBLNK01 and FCRDBLNK01) display erratic results within an acceptable margin of error, which might indicate contamination within the sample runs. The sampling protocol submitted to ALS should include the directive to run and flag the immediate subsequent sample for re-assay.

Analysis of the standards submitted to ALS indicates a trend to under report the values in the higher grade standards. This trend should be followed up with additional testing and a cross checking program conducted at an independent laboratory.

The authors' opinion is that Klondex's current QAQC program, for sampling protocols, is managed in an acceptable manner. QAQC verification demonstrates good intent to ensure the integrity of Klondex sampling results which were included in the evaluation of the mineral resource estimate.

It is Klondex's intent that those samples with standard results outside the acceptable statistical mean be re-run. To date, such re-runs have not been completed.



12 Data Verification

12.1 Data Validation Prior to 2012

Historic data validation has previously been addressed (Raven et al., 2011). A summary of their work includes:

"…Until late 2010 Klondex did not employ any submitted sample based QAQC program. Prior to that time, the only QA reporting was derived from the commercial laboratory's internal QA programs that included internal blanks and standards, and automatic re-assays of pulps in which the gold grades exceeded 1 g/t. In addition a significant number of samples were sent to a different laboratory for check analysis. Subsequently Klondex has initiated its own internal quality control procedures. Presently (2011) Klondex has prepared blank samples using post-mineral basalt core from well above the mineralized zones. In addition two standards were prepared (low and medium grade) by ALS from Fire Creek assay rejects and there have now been enough analyses of the standards to determine their average grade and standard deviation. (Page 25)

"…A blank and two standards are now included in each drill hole as standard practice. (Page 25)

"… A review of the data from the 2010 drilling campaign that made use of the new QAQC procedures did not outline any difficulties with the new standards and blanks that would indicate an error at the lab. The check assays performed on drill core samples that assayed >1 g/t gold show good agreement between the original assay and the check assay. (Page 27).

"…The ALS/Chemex facility at Elko is certified to ISO 9001:2008 standards and only handles sample receiving and preparation. The ALS/Chemex facility in Reno provides a broader range of analytical services and is also certified to ISO 9001:2008 Standards; in addition it has received accreditation to ISO/IEC 17025:2005 from the Standards Council of Canada (SSC) for Fire Assay Au by Atomic Absorption, which is the analytical method Klondex utilizes for its gold analyses. (Page 27)

"…All gold assays in excess of 1.0 g/t are rerun at least once. A large number of gold reruns are also carried out where values are below 1.0 g/t. These were either on samples adjacent to intervals with elevated gold assays, on samples with elevated silver values and low gold, or at the discretion of the geologist when lithologic characteristics were suspect. (Page 29)

"…samples with greater than 10 g/t gold were rerun using a 50 gram fire assay with gravimetric finish (ALS-Chemex Au-GRA22 procedure) to late 2010 then a 30 gram charge subsequently. (Page 29)

"…The checked assays are usually in good agreement with the original assay indicating no significant nugget effect. (Page 29)

"…Additional check assays have been received from the 2009 and 2010 drilling campaigns and they show a similarly good correlation between the original assay and the duplicate, or check assays. (Page 29)

"…There have been approximately 4,000 duplicate samples submitted for check analyses as part of the QAQC program. (Page 31)

"…Klondex undertook some umpire assays at different laboratories to verify a portion of the higher grade results and compared analytical methods for gold by fire assay with an AA finish vs. a gravimetric finish. Silver was also included in the analysis between the two labs. (Page 32)

"…The authors (Raven et al., 2011) verified a portion of the drill core data by re-assaying sample pulps sent to SGS Mineral Services in Vancouver, BC. The SGS laboratory is an ISO 9001:2008 accredited facility. Coarse reject material for all the samples selected was not available so sample pulps were chosen over splitting the remaining core. The samples selected for verification were from a broad range of drill holes and designed to test various grades of mineralization from low- to –high grade. (Page 34)

"…There is a good agreement between the original values vs. the check assays as noted in the charts above for nearly 4,000 check samples and it is felt that this correlation is sufficient and demonstrates that while there are spurious values indicating some nugget effect, in most cases the nugget effect is minimal. (Page 36)

"…Author Raven did note in the drill core and corresponding assay results for those intervals that the better gold grades are confined to intervals containing quartz +/- carbonate veining, either larger (>0.5 metre) discrete veins or stockwork systems of veining. Klondex has assayed numerous intervals of visually barren mafic volcanics (no veining, fracturing or faulting) and those intervals do not return anomalous gold assay". (Page 36)

12.2 Data Validation from 2012 until 2013

In January 2013, QP, Michele White, commenced review of Klondex drilling and channel sample data and protocols for Fire Creek. This review was performed for verification purposes to



allow the Klondex datasets to contribute to future evaluations of the 2013 Fire Creek underground mineral resource estimate. This validation addresses assay results from drilled material sampled between March 2004 and June 2013 for surface drilling, and between September 2011 and June 2013 for underground drilling and includes channel samples from production drifts and decline development.

Klondex Geology Data Administrator, Ms. Hazel Reynolds, provided specific datasets for validation based on a centralized merger of historic datasets for use in resource modeling. The authors analyzed a random population of datasets representing no less than one percent and optionally up to 25% of the total samples produced from sampled material used in the resource estimate.

In addition to verifying gold values for sampled material derived from drilling and channel samples at Fire Creek, this validation also reviewed general technical data related to sampling, such as the location of the drill hole collars, channel sample locations, and the downhole survey data per sampled interval. Geologic data were also reviewed to validate the data to be used as part of the geologic modeling for shaping and projecting trends of the mineralized bodies for resource estimates.

Specific technical dataset audits were compared for direct correlation, record-by-record, between the original source data and the 2013 database. Results were then compared to the 2013 Vulcan mine modeling software database 'ISIS' (ISIS) for consistency. The scale of detailed examination record-by-record produced a positive data validation covering between seven-percent and 99% of the data in the database, which upholds the integrity of the assay values for use in the resource estimate.

12.3 Datasets Submitted for Evaluation

Three datasets and related source files for estimating the resource were reviewed by the authors. The datasets reviewed are from the surface drilling program between March 2004 and June 2013, the underground drilling program between September 2011 and September 2013, and channel samples between April and September 2013. These datasets were reviewed for accuracy and as a validation of the underground resource estimate for this Technical Report. Specific details of the sampled material include review of:

- Collar locations: one raw survey report for surface drilling, no survey data for channel samples, 408 drill holes in the ISIS database and 1120 channel samples;



- Downhole survey: raw survey report data, 15% of all drill holes in the database and the ISIS database;
- Lithology: historic electronic logs, 93% of all drill holes in the database and the ISIS database;
- Klondex historic scanned cut-sheets with SampleID and intervals, one percent of all drill holes in the database; and
- Assays: Original ALS PDF assay result certificates for 79% of all drill holes in the database and the ISIS database, and assay certificates for all of the channel samples.

Table 12-1, below, summarizes the numbers and percent of drill holes reviewed for this report:

Table 12-1 Data Review Summary Drilled Material

Datasets for:	Total drill holes	Holes: Collar XYZ, Az, Dip, TD reviewed	Holes: Downhole Survey reviewed	Holes: Lithology reviewed	Holes: Cut-sheets reviewed	Holes: Assay certificates reviewed
UG Core	109	55	37	67	5	83
Surface Core/RC	299	1	24	211	3	149
Totals	408	56	61	278	8	232
Percent of population reviewed:		13%	14%	68%	1%	56%

12.4 Collar Location Checks

There are no historical collar survey reports to locate surface drill holes between March 2004 and December 2010, and no historical collar survey reports to locate underground drill holes since underground drilling began in September 2011 until February 2012. The historic surveying methodologies provided to the authors by Klondex and the positive results of a recent re-survey of about 10% of the historic surface collars is considered by the authors to be adequate to verify the historic collar locations for surface exploration drilling.

The authors reviewed the 2012 Joggerst survey results spreadsheet provided by Klondex for 53 of the 86 underground drill holes in the database and found an 87% match for easting, northing and elevation. The non-matching locations were off by less than 15 feet. No azimuth or dip was recorded in the survey spreadsheet. It is unknown to the authors in which datum the original

2012 Joggerst survey information was collected or if the information was subsequently re-projected.

In summary, the authors have relied on the positive results of a re-survey completed by Klondex in 2013 to locate the historic surface collar locations and to verify the validity of the 380 surface drill hole locations.

The authors also verified the location of 86 underground drill hole locations as valid based on the positive review of the 2012 Joggerst survey spreadsheet and the fact that all the drill holes were drilled from one station, Drill Station 1.

The authors reviewed and verified the locations of 1120 channel samples by means of projecting the sample locations in 3-D with the surveyed asbuilts.

12.5 Downhole Survey Checks

The underground drilling program and subsequent downhole drill surveys began at Fire Creek in the fourth quarter of 2011. Klondex collected raw data and then applied corrections to compensate for the local declination at Fire Creek of 13.35 degrees, according to the NOAA calculator. The corrected downhole survey data was then uploaded into the database. As a result, the raw downhole survey data matches the dip but not the azimuth for some of the 2011, 2012 and 2013 underground drill holes in the database.

12.5.1 Surface Downhole Survey Review

The authors reviewed 595 downhole survey records from 24 surface drill holes against the 7,484 total records in the database (seven percent of the total surface downhole survey record population). There were 571 direct matches and 24 records with discrepancies in the footage, the dip, or the azimuth. In summary, seven percent of the surface downhole surveys in the database were matched with original downhole survey records, demonstrating reliable data integrity.

12.5.2 Underground Downhole Survey Review

Additionally, 417 downhole survey records from 37 underground drill holes were compared against the 1271 total downhole survey records in the database (32% of the underground downhole survey records population). There were 291 direct matches and 198 records with non-matches. All of the non-matches are attributed to the original survey azimuth being corrected for regional declination prior to being entered into the database, with some surveys being further edited to adjust for collar and quill survey data verification. In summary, about 32% of the underground downhole survey records in the database were matched with original survey records demonstrating reliable data integrity.

The authors conclude that the state of downhole surveys for the surface and underground drilling programs are accurate and reliable for use in modeling the geology and resource.

12.6 Assay Certificate Checks

The authors reviewed assay values of 83 underground drilled core holes and 149 surface drilled RC and core holes in the database to compare these values to the original PDFs of certified assay results from ALS, which is about 56% of the total drill holes in the database. Overall, the total of records reviewed was 29,949 out of 79,949, or approximately 37%. The results were predominantly direct matches with 69 errors in the underground assays (or a little over 0.2%) and 108 errors in the surface assays (or a little over 0.3%). The errors may be attributed to a random selection of assay records and lack of supporting re-assay certificates of the same sample at a later time. The non-matches were infrequent and did not reflect a data integrity problem. In addition to noting matches and errors, there were no QAQC samples observed in the certified assay results prior to 2012; that is, no blanks or standards were submitted with the original samples. The historic sampling protocol relied solely on the internal QAQC performed by ALS.

The authors also compared assay values of 1,384 samples from the channel sample database to original PDF files of certified assay results from SGS. There were 939 matches between SGS certificate and the database. The channel sample certificates included QAQC samples.

In summary, the database demonstrates acceptable correlation between the original assay certificates and the centralized assay values, despite the lack of consistent QAQC sampling.

12.7 Lithology Review

Klondex's historic lithological database prior to 2012 (acquired from MinQuest) contained only interpretive unit names that lumped tuff and basalt units. The historic logging was conducted on paper forms, then logged data was hand-entered into RockWare LogPlot software. Detailed observations were reduced to interpretive unit codes, which comprised the lithological portion of the database. The core and RC portions of the holes had separate logs.

The historic logging format was revised in 2012 with direct input into an Excel spreadsheet with columns populated with links to lookup tables. This logging was performed on electronic Tough Book tablets. The new codes allowed tuffs and basalt lithologies to be separated into specific units.

During 2013, all historic core was re-logged in Sparks into this newer format because the core tails of the drill holes were not photographed, the sampling of important horizons was poor, and important units of tuff and basalt were lumped together.



The new database contains exclusively lithology or rock types, which allows geological details to be captured in more detail. Specifically, the geologic section at Fire Creek contains interbedded basalt and tuff units (at least three distinctive tuffs). The tuff units contain very little mineralization. Though un-mineralized, these units appear to be very good marker beds for ponded mineralization in the basalts. The new logging program emphasized the importance of identifying these specific tuff units as waste rock for the geologic model in order to better constrain modeling mineralization in the basalt.

As a result of the 2013 re-logging program, tuff units were identified in the newer logs, and the older log plot data were used for the RC portions of the model. Significantly, some of the new codes in the database were derived directly from reading the geologists' detailed descriptions in the comments field as to veins, structures and, most importantly – the tuffs or basalts. This explains why a direct correlation between the original logs and the database is complex. Some of the database refers to historic RC logs, some of the database refers to the results of the re-logging program in 2013, and some of the lithological codes in the database were derived from the detailed observations in the comments field.

Each of these geological logging systems were reviewed by the authors, and the results validate the geology in the database by direct correlation with an original data set to within these means.

12.7.1 Surface Drill Hole Lithology Review

From the 299 surface drill holes in the database, 211 (or about 70%) of the surface geological logs were randomly selected and reviewed by the authors. From the 17,759 lithology records for surface drilling in the database, 15,208 lithology records were directly matched to logs and 25 of them were non-matches. The latter were found to be based on detailed observations from the comments field. In these cases, the record was flagged as a non-match, but the comments field verified the code in the database.

12.7.2 Underground Drill Hole Lithology Review

Of the 109 underground drill holes in the database, 67 of the geological logs were reviewed by the authors. From the 4,168 lithology records for underground drilling in the database, 2,455 records were direct matches with logs and 60 of them were non-matches. The latter were found to be based on detailed observations from the comments field. In these cases, the record was flagged as a non-match, but the comments field verified the code in the database.

In summary, the only errors between the original geological logs and the database for lithology were resulting from new interpretations focusing on breaking out tuffs and basalt units derived from the comments field rather than the geologic code recorded in the log. These discrepancies

were found to be based on actual comments and were considered by the authors to be accurate interpretations of the geology based on core logging.

12.8 Klondex Database Compared to the ISIS Database

In January 2013, QP, Michele White analyzed digital copies of the database specific to supporting the updated resource estimate for Fire Creek. The digital files provided original compilations of spreadsheets over time to compare with the actual dataset utilized in Micon's Datamine geology and mineralization model. Details regarding how the data was organized and cleaned for importing into mine modeling software are itemized in Section 14.2 of this Technical Report.

For this data verification, each dataset of collars, downhole survey, lithology and assays were checked for chain of custody integrity, and were compared then to the original source data prior to cross-checking it against the ISIS database used for modeling. Each record reviewed was flagged as 'checked', in order to estimate a total percentage of data analyzed. Exact matches of data between the original datasets and the ISIS database were flagged as 'GOOD'. Non-matches were flagged as 'BAD'. The results are summarized below.

12.8.1 Collar Locations

There are 380 drilled hole collars in the clean database and 380 drilled hole collars in the ISIS database. Of these 380 collars, the eastings, northings, elevations, azimuth, and dip values in the ISIS database correspond exactly with those in the database. This equates to a 100% match between the ISIS database and the original data.

There are 673 synthetic collars for channel samples in the clean database and 673 synthetic collars for channel samples in the ISIS database. Of these, the eastings, northings, and elevations of 627 match exactly. There are 45 synthetic collars of channel samples, which differ between the database and the ISIS database by an elevation of 5 feet. The authors assume some adjustment was made for these sample locations during Vulcan modeling to align the channel samples with the asbuilts. The direct matches between the ISIS database and database are within 93%, and the author considers the edits to elevation to be acceptable considering accuracy of locating the surveyed asbuilts.

12.8.2 Downhole Surveys

There are 8,299 downhole survey records for drilled holes in both the ISIS and the database. All of the records match.

There are 972 synthetic downhole survey records for channel samples in the ISIS database. Of these, four records are duplicates of the same hole ID and depth. The authors compared 398 records of synthetic downhole surveys for channel samples in the database with the ISIS database and found no discrepancies.

12.8.3 **Lithology**

There are 21,304 drill hole lithological records in both the ISIS database and the database. Of these, there were five records in three drill holes that were off by less than a foot in the problem interval, which represents an excellent match of nearly 100% direct correlation between the ISIS database and the database for drilled holes.

There are 434 channel sample lithological records in the ISIS database. The authors compared 389 (90%) of the ISIS records to the database. All of the lithology records matched.

12.8.4 **Gold Assays**

There are 72,318 total surface and underground assay records in the ISIS database used in this mineral resource estimate. There are 1,392 channel assay records in the ISIS database used in this mineral resource estimate.

All of the drilling data assay values and sample intervals in the ISIS database match the assay values and sample intervals in the database. There is a 100% correlation.

There are 1,392 channel sample assay records in ISIS, not all of which are used in the resource estimate. The channel samples include five series of sample naming conventions: ‘decl’ prefix for samples taken from ribs of the decline, ‘VR’ prefix for samples taken from the vent raise drift, ‘s’ prefix for samples taken from production level ribs, and ‘5370’ and ‘5400’ prefixes for samples taken from production level mining faces. The direct comparison of channel sample assay records, including sample intervals and gold values, between the ISIS database and database disclosed an opt-conversion error propagated in part of the s-series channel samples as follows:

- 641 total s-series channel sample assays in ISIS;

- 456 records incorrectly have the Au opt value from the assay certificate in the g/t field. This error is the source of generating opt calculation errors for the 456 decl-series channel samples;

- 90 s-series records are good matches between ISIS opt and Klondex opt; and

- 95 s-series records are non-matches due to either: the ISIS database having an assay value, while the database has no sample or below detection limit value, and vice versa; or the ISIS database having a no sample (-99) value, while the database has an assay value.

There are two s-series channel samples used in the mineral resource estimate. Those records are correct.

In summary, of the 1,392 channel sample records in the ISIS database, all of the assay and sample intervals for the levels 5370 and 5400, and decline channel samples directly match with the database. That is a 100% match. The s-series channel samples in the ISIS database contain 71% errors, of which, none of the incorrect values were used in the mineral resource estimate. All of the errors in the s-series portion of the ISIS database have been updated to correct values that match the validated database.

12.9 Summary of Database Verification

The ISIS database, inclusive of all drilled and channel sample data up to September 2013, complies with standards prescribed by CIM protocol for use in reserve estimates.

In summary, for each data set, at least five percent, and up to 100%, of the data under review was verified against original source data as listed above for accuracy. The result was a centralized database under the control of Klondex corporate staff.

The authors consider that the verification work for this report is at a sufficient level to allow the use of the database in a CIM mineral resource estimate, which verified that the results of historic and current drilling and control samples are acceptable. In particular, the accuracy of the assay database has been quantified by independent review for 79% of the assay results utilized in the ISIS database by direct correlation with scanned assay certificates from accredited laboratories. Checking results indicate there is no significant grade bias in the primary laboratory data.

13 Mineral Processing and Metallurgical Testing

13.1 Early Test Work

A summary of the cyanidation test work conducted on twelve Fire Creek samples discussed in the 2011 NI 43-101 Technical Report by W. Raven, E. Ullmer, and G. Hawthorn is shown below in Table 13-1.

Table 13-1 Summary of Cyanidation Test Results from 2011 Technical Report

Sample ID	Zone	Drill Hole	Interval	Head Grade Au (g/t)	Head Grade Au (opt)	Test Type	Grind Size	Duration (hrs)	Au Recovery
1	North Main	FC0401		2.0	0.058	CIL			75.9%
2	North Main	FC0403		14.5	0.423	CIL			80.0%
3	North Main	FC0405		34.6	1.009	CIL			60.1%
5	North Main	FC0402	905-910	37.1	1.082	STD	25%-200M		33.2%
5	North Main	FC0402	905-910	37.1	1.082	STD	90%-200M		81.6%
C4	North Main	FC0528	1450-1470	7.8	0.227	STD	80%-60M	48	72.6%
7	Main	FC0413	850-855	109.0	3.178	STD	25%-200M		74.4%
7	Main	FC0413	850-855	109.0	3.178	STD	90%-200M		98.7%
C1	Main	FC0419	777-780	37.4	1.091	STD	80%-70M	48	88.2%
C3	West Main	FC0515	925-935	116.4	3.394	STD	80%-65M	48	86.8%
4	Far North-New North	FC0415	850-855	10.0	0.292	STD	25%-200M		14.0%
4	Far North-New North	FC0415	850-855	10.0	0.292	STD	90%-200M		15.8%
6	Far North-New North	FC0415	830-835	10.8	0.315	STD	25%-200M		29.5%
6	Far North-New North	FC0415	830-835	10.8	0.315	STD	90%-200M		54.5%
C5	Far North-New North	FC0418	895-915	6.1	0.178	STD	80%-65M	48	45.4%
C6	Far North-New North	FC0522	1040-1050	20.1	0.586	STD	80%-80M	48	77.2%

13.2 2013 Test Work

Metallurgical test work was conducted by McClelland Laboratories (MLI Job #3834) on two samples taken from the underground development to determine the amenability of the Fire Creek material to gravity and/or cyanidation treatment. Composite sample FCM1 was taken from material stockpiled during the development of the 5400 and 5370 crosscuts. Sample 3834-01 was generated by compositing coarse assay rejects from the face sampling on the Joyce 5400 N.

Each sample was milled to 80% minus 212µm and processed through a laboratory Knelson concentrator to determine precious metal recovery via gravity concentration. The tailings from the Knelson concentrator were reground to 80% minus 75µm. Direct cyanidation tests (96-hour

bottle roll tests) were then conducted on the gravity tailings to determine precious metal recovery and reagent consumption. Results of the test work are shown in the Table 13-2 below.

Table 13-2 Combined Metallurgical Results, Gravity/Cyanidation Tests, 80% -212 υm Feed (Grav.), Reground to 80% -75 υm (CN)

		Recovery % of Total			g/tonne Extracted			g/tonne Head Grade		Reaget Addition kg / tonne	
Composite		Grav. Conc.	CN (Grav. Tail)	Combined	Grav. Conc.	CN Leach	Tail	Calculated	Assayed	NaCN	Lime
3771 Composite FCM1	Au	19.6%	75.3%	94.8%	2.24	8.61	0.59	11.44	15.00	0.16	5.0
Sample 3834-91	Au	54.4%	44.7%	99.0%	80.80	66.33	1.42	148.55	157.07	0.24	3.1
3771 Composite FCM1	Ag	14.4%	67.8%	82.2%	1.30	6.10	1.60	9.00	6.00		
Sample 3834-91	Ag	44.6%	44.8%	89.4%	44.40	44.60	10.5	99.50	115.00		

Results indicate that both samples were readily amenable to gravity and/or cyanidation treatment. Gold and silver recoveries achieved from composite sample FCM1 were 94.8% and 82.2%, respectively. Gold and silver recoveries achieved from sample 3834-01 were 99.0% and 89.4%, respectively. Cyanide consumptions were low, averaging 0.20 kg/mt material.

13.3 2014 Test Work

In early 2014, nine drill core composite samples from the Fire Creek West Zone were submitted to McClelland Laboratories (MLI Job #3870) for metallurgical testing to determine the amenability of the Fire Creek West Zone material to direct cyanidation and gravity/cyanidation treatment.

Each composite was milled to 80% minus 75µm, and direct cyanidation tests (bottle roll tests) were then conducted to determine precious metal recovery and reagent consumption. Results of the test work are shown in the Table 13-3 below.

Table 13-3 Summary Metallurgical Results, Bottle Roll Tests, Fire Creek West Zone Drill Core Composites

		Au	g Au/mt ore				Ag	g Ag/mt ore				Reagent Requirements	
Test		Recovery,			Calculated	Head	Recovery,			Calculated	Head	kg/mt mineralized material	
Number	Composite	%	Extracted	Tail	Head	Assay	%	Extracted	Tail	Head	Assay	NaCN Cons.	Lime Added
CY-1	3870-1	96.0	34.88	1.46	36.34	46.10	94.1	17.4	1.1	18.5	30.3	0.17	0.8
CY-2	3870-2	94.9	20.23	1.08	21.31	26.18	74.9	12.8	4.3	17.1	26.2	0.39	5.6
CY-3	3870-3	89.8	6.66	0.76	7.42	10.28	67.4	6.4	3.1	9.5	15.3	0.33	6.9
CY-4	3870-4	96.9	14.51	0.46	14.97	12.51	76.9	1.0	0.3	1.3	1.9	0.17	7.6
CY-5	3870-5	93.2	38.28	2.80	41.08	30.30	56.3	57.4	44.6	102.0	92.5	0.28	3.7
CY-6	3870-6[1)]	66.9	3.92	1.94	5.86	7.67	81.2	22.9	5.3	28.2	36.8	12.16	20.5
CY-7	3870-7	84.0	22.32	4.24	26.56	30.33	57.8	17.0	12.4	29.4	35.7	0.38	3.6
CY-8	3870-8	82.1	60.94	13.30	74.24	63.33	71.7	34.0	13.4	47.4	36.9	0.31	2.4
CY-9	3870-9	98.7	48.41	0.62	49.03	73.87	83.5	27.8	5.5	33.3	50.3	0.34	4.2

1. *Problems encountered with high viscosity, low D.O. and low free cyanide levels. Switched to mechanically agitated leach @ 2.0 g NaCN/L, 25% Solids at 20 hours, initiated are sparge at 24 hours.*

Results indicate that all but one (Composite #3870-6) of the samples were readily amenable to direct cyanidation treatment. Gold recoveries achieved from the eight composite samples ranged from 82.1% to 98.7%. Silver recoveries achieved from the eight composite samples ranged from 56.3% to 94.1%. Cyanide consumptions were low, averaging 0.30 kg/mt material.

Problems were encountered during direct cyanidation testing of composite #3870-6 due to high viscosity, low dissolved oxygen content and low free cyanide levels. This composite was transferred to a mechanically agitated leach apparatus to complete the test. Gold and silver recoveries achieved from composite #3870-6 were 66.9% and 81.2%, respectively. Cyanide and lime requirements for this sample were very high.

After direct cyanidation testing was complete, two master composites were prepared for gravity/cyanidation testing. A high-grade master composite (HG master comp) was prepared by combining the coarse rejects from Composites 3870-5 and 3879-6. A mid-grade master composite (MG master comp) was prepared by combining coarse rejects from Composites 3870-2, 3870-3 and 3870-4.

Each master composite was milled to 80% minus 300µm and processed through a laboratory Knelson concentrator to determine precious metal recovery via gravity concentration. The tailings from the Knelson concentrator were reground to 80% minus 75µm. Direct cyanidation tests (96-hour bottle roll tests), with and without lead nitrate addition, were then conducted on the gravity tailings to determine precious metal recovery and reagent consumption. Results of the test work are shown in Table 13-4 and Table 13-5 below.

Table 13-4 Gold Metallurgical Results, Whole Mineralized Material Gravity Concentration with Cyanidation of the Gravity Cleaner and Rougher Tailings

		Weight , % of Total			g Au/mt mineralized material					
Composite	Lead Nitrate Added	Gravity Cl. Conc	Combined Cl. & Ro. Tail	Total	Ball Mill Clean Out	Gravity Cl. Conc	Extracted (CN)	Tail	Calc. Head	Predicted Head
3870-29 (HG Master Comp.)	No	0.21	99.79	100.0	0.14	10.416	19.79	2.70	33.05	30.32.
	Yes	0.21	99.79	100.0	0.14	10.416	17.60	2.54	30.70	
3879-30 (MG Master Comp.)	No	0.26	99.74	100.0	0.02	4.68	10.45	0.69	15.84	12.54
	Yes	0.26	99.74	100.0	0.02	4.68	8.50	0.73	13.93	

	Au Distribution % of Total						kg/mt ore	
Composite	Ball Mill Clean Out	Cl. Conc	Extracted (CN)	Combined	Tail	Total	NaCN Cons.	Lime Added
3870-29 (HG Master Comp.)	0.4	31.5	59.9	91.4	8.2	100.0	0.31	3.5
	0.5	33.9	57.3	91.2	8.3	100.0	0.31	3.5
3879-30 (MG Master Comp.)	0.1	29.5	66.0	95.5	4.4	100.0	0.09	6.5
	0.1	33.6	61.0	94.6	5.3	100.0	0.15	6.7

Table 13-5 Silver Metallurgical Results, Whole Mineralized Material Gravity Concentration (80%-300µm Feed Size) with Cyanidation of the Gravity Cleaner and Rougher Tailings (80%-75µm Regrind Size)

		Weight , % of Total			g Ag/mt mineralized material					
Composite	Lead Nitrate Added	Gravity Cl. Conc	Combined Cl. & Ro. Tail	Total	Ball Mill Clean Out	Gravity Cl. Conc	Extracted (CN)	Tail	Calc. Head	Predicted Head
3870-29 (HG Master Comp.)	No	0.21	99.79	100.0	0.12	7.056	31.43	25.45	64.06	
	Yes	0.21	99.79	100.0	0.12	7.056	48.00	11.28	66.45	
3879-30 (MG Master Comp.)	No	0.26	99.74	100.0	0.06	2.184	7.48	3.29	13.02	
	Yes	0.26	99.74	100.0	0.06	2.184	6.48	3.39	12.12	

	Au Distribution % of Total					
Composite	Ball Mill Clean Out	Cl. Conc	Extracted (CN)	Combined	Tail	Total
3870-29 (HG Master Comp.)	0.2	11.0	49.1	60.1	39.7	100.0
	0.2	10.6	72.2	82.8	17.0	100.0
3879-30 (MG Master Comp.)	0.5	16.8	57.5	74.3	25.3	100.0
	0.5	18.0	53.5	71.5	28.0	100.0

Results indicate that both master composites were readily amenable to gravity/cyanidation treatment. Gold and silver recoveries achieved from the HG master composite were 91.4% and 60.0%, respectively, without lead nitrate, and 91.2% and 82.8% with lead nitrate addition. Gold and silver recoveries achieved from the MG master composite were 95.5% and 74.3%, respectively, without lead nitrate, and 94.6% and 71.3% with lead nitrate addition.

14 Mineral Resource Estimates

14.1 Introduction

The Fire Creek mineral resource was estimated in accordance with CIM Definitions Standards on Mineral Resources and Mineral Reserves (CIM 2010). Estimation best practices were applied. The purpose of this estimate is to include the new drill holes, which were drilled since the last mineral resource estimate in August 2013. All data coordinates are measured in the Nevada State Plane Central Zone, NAD83 feet.

The Fire Creek geologic and resource modeling was performed by Karl Swanson, Independent Consultant, SME, AusIMM and Laura Symmes, Senior Geologist Practical Mining, using Vulcan Software versions 8.1.3 and 8.1.4. Statistics and variography were calculated with Sage 2001 software.

The vein solids were modeled from both the assay data and the lithology logged data; therefore, no strict grade cut-off was honored, but only vein material was modeled regardless of the grade. Block gold grades were estimated using Inverse Distance Cubed method and checked against an estimate created using Nearest Neighbor methods.

14.2 Drill Hole Database and Compositing

Klondex provided drilling data in CSV format extracted tables from spreadsheets to Practical Mining. The tables were loaded into a Vulcan ISIS database; “kfc6mar2014.ddh.isis”. The gold and silver assays were given in g/t, and the gold assay was then converted to opt by dividing by 34.2854. Assays were flagged by the vein solids and composited within the veins. The vein flag, "vn01', "vn02", etc. was stored in the vein variable in the database. Each drill hole that intercepts the vein solid has at least one assay flagged with that vein's name. Only the gold opt assay was used for estimation. The silver assay data is not as complete as the gold assay data but should be included in future models in order to better understand the relationship with gold.

14.2.1 Assays

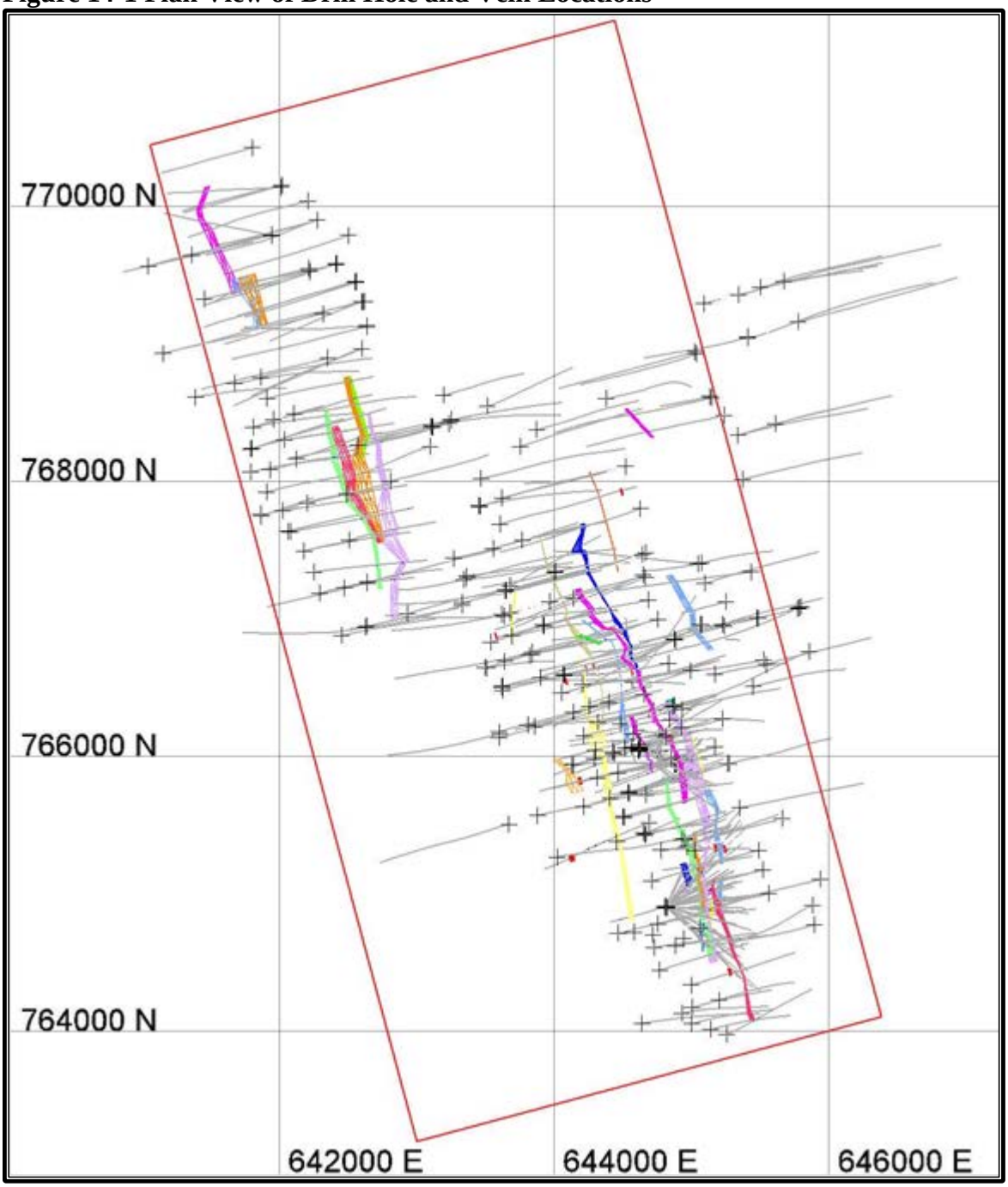
This analysis used 408 surface and underground drill holes and 1,120 channel and rib sample sets. Of the 408 drill holes, 52 are RC and 356 are core. Only eight of the 52 RC holes contained intervals that were flagged by the vein models. The composites of all flagged assays were used for statistical analysis and estimation. No drill holes were eliminated for any reason. Table 14-1 summarizes details from the drill hole assays.

Table 14-1 Summary of Drill Holes

	Not Flagged by Veins			Flagged by Vein Models				Total		
Type	No. Holes	Length Drilled	Length Sampled	No. Holes	Length Drilled	Length Sampled	Length Flagged	No. Holes	Length Drilled	Length Sampled
Drill	187	202,631	205,136	221	234,537	232,071	3,043	408	437,218	437,207
Channel	638	3,004	3,004	482	2,168	2,168	1,342	1,120	5,172	5,172

Figure 14-1 shows the drill locations within the model area with the vein solids and the block model outline for reference.

Figure 14-1 Plan View of Drill Hole and Vein Locations



14.2.2 Geology Logs

The “rock” (rkname) field from the lithology table in the database was used to model vein locations and extents. This was used to help locate the vein where the gold mineralization value is low. The Rock Name codes are listed in Table 14-2. The drill logging shows that there is an upper and lower tuff unit within the Basalt. Figure 14-2 is a long section through the deposit

showing the tuff in blue and the Basalt in light green. Figure 14-3 is the same long section showing the vein solids.

Table 14-2 Rock Name Codes

Geologic Unit	Code
overburden	OVB
sedimentary	SEDS
opalized sinter	OPAL
intrusive	INT
structure	STR
Fault	FLT
Vein	VN
Basalt	BAS
Breccia	BX
tuff	TUFF
no data	ND

Figure 14-2 Geologic Logging on Long Section

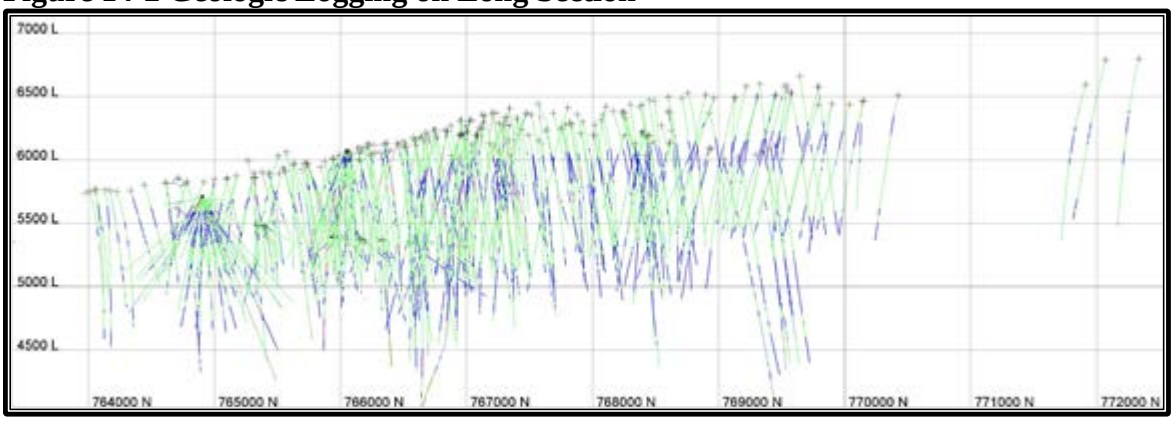


Figure 14-3 Geologic Logging Tuff Solids on Long Section

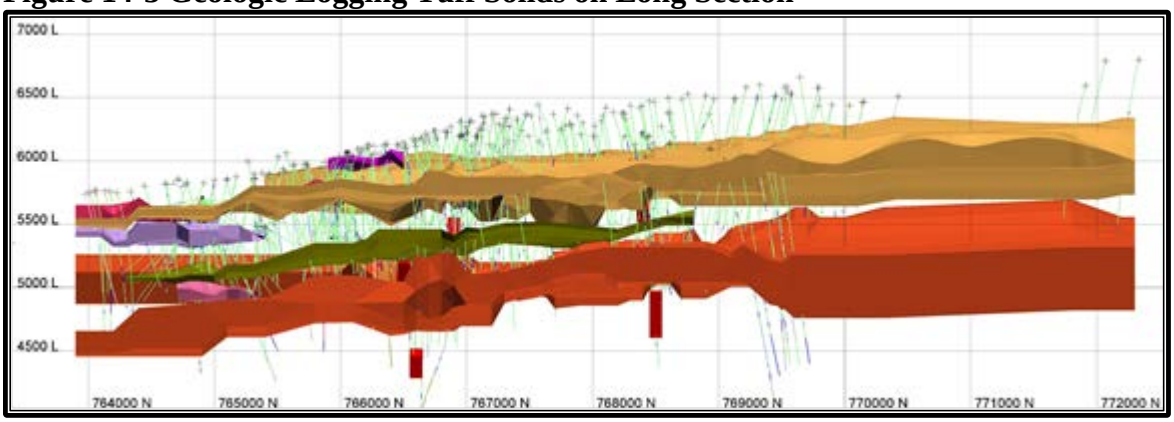
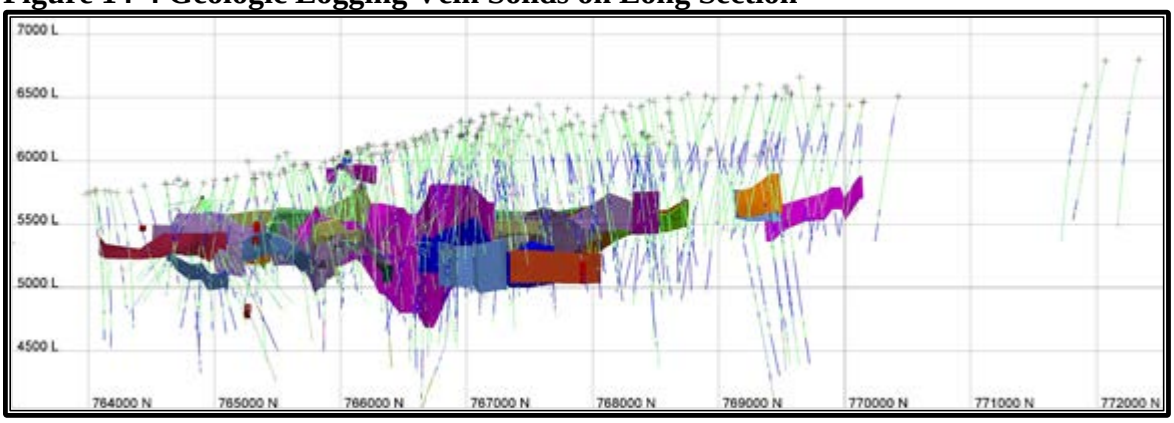


Figure 14-4 Geologic Logging Vein Solids on Long Section



14.2.3 Compositing

The assays were composited on ten-foot downhole interval lengths honoring the vein flag. Therefore, the assays within the veins are separated from the lower grade values outside of the veins. This compositing method usually calculates a single composite across the vein interval as most vein intercepts are less than ten feet in length. Where the interval within the vein was longer than ten feet, more than one composite was created. The gold and silver composite database is named, “kfc4mar2014.cmp.isis”.

Vein intercepts from 703 channels and drill holes were flagged. These vein intercepts consisted of 1,395 samples with gold assays greater than zero for a total intercept length of 4,377 feet. The number of flagged composites with gold grades greater than zero is 1,003 for a total of 4,362 feet. All of these flagged composites were used for statistics and estimation.

14.3 Geology and Vein Modeling

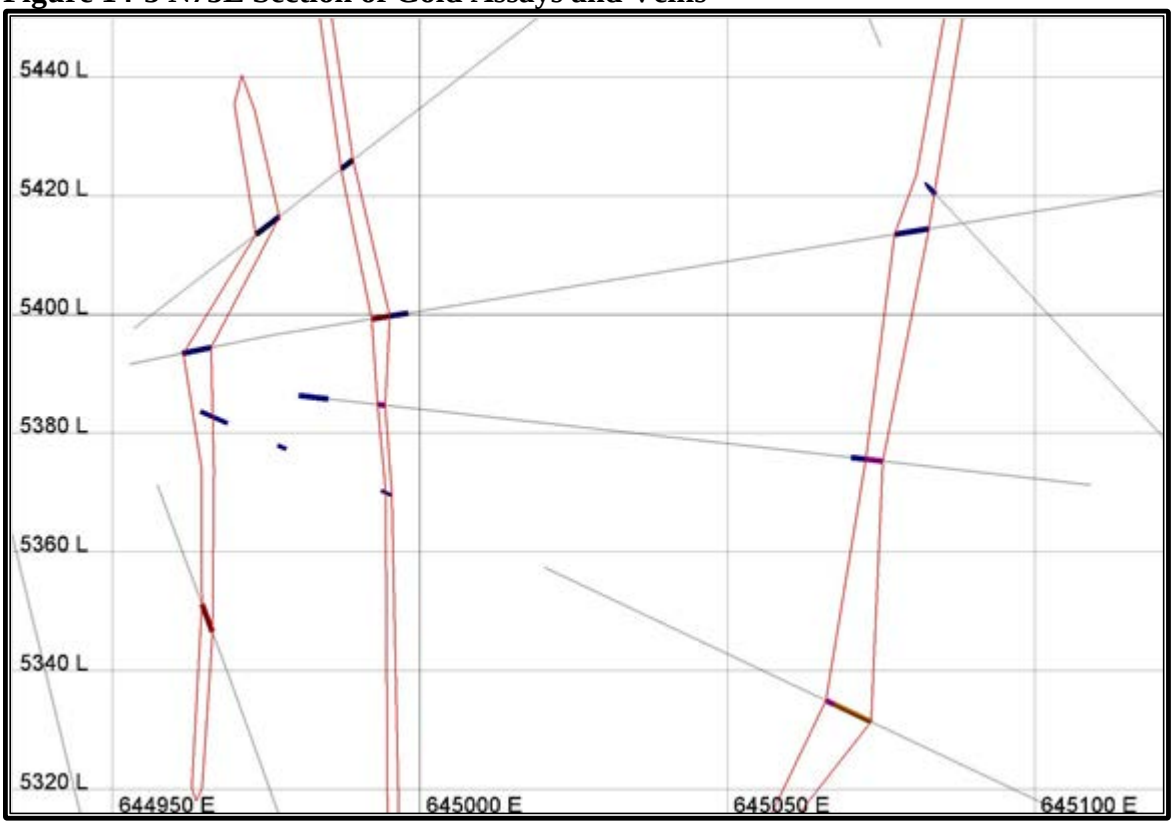
The basalt and tuff units were not modeled in this analysis but should be in the future as they probably impact groundwater flow and rock stability. Currently, the rock units in this analysis do

not seem to impact vein location or mineralization; however, displacement of the units due to faulting and movement, both pre and post mineralization, may help on understanding local and regional geology and thus direct exploration activities.

Thirty-five veins were modeled on two main northwest linear trends, which are approximately 1,300 feet apart east to west. Both trends generally strike N15W, but the east trend ends at about 767,400N and the west trend begins. This offset may be the result of a northeast trending fault, but is not clear at this time. Current mining and channel sampling is focused on the Vonnie Vein (vn01) and Joyce Vein (vn02) located in the North, Main, and South zones of the eastern trend.

The veins were modeled on N75E cross sections spaced 25 feet apart using the gold assay drill intercepts and geology. A strict cut-off grade was not enforced because portions of the vein are very low grade. Regardless of the grade, a low assay was chosen to represent the vein if the drill hole intercepted the modeled vein. Figure 14-5 shows a cross section of the interpreted veins with drilling color-coded by gold grade in opt.

Figure 14-5 N75E Section of Gold Assays and Veins



14.4 Specific Gravity and Density

The average density of all rock and all vein material is 0.0774 tons per cubic foot (2,480 kg/m^3), which was provided by Dr. Shuai Chen, Chief Engineer at the Project. This density value was derived from 15 samples collected by Fire Creek Geology Department on the Joyce Vein (vn02) and Vonnie Vein (vn01) and analyzed by SGS Laboratories in Elko, Nevada.

14.5 Statistics and Variography

Univariate statistics were calculated for the gold and silver assays and for composites that were flagged within the veins. Results are shown in the Table 14-3 and Table 14-4 below.

Table 14-3 Gold and Silver Assay Statistics within the Veins

Field	# Assays	Min	Max	Mean	Std Dev	CV
Au opt	1295	0.0001	881.6	7.739	45.126	5.8310
Ag opt	1178	0.0073	509.0	3.9512	25.531	6.4615

Table 14-4 Gold and Silver Composite Statistics within the Veins

Field	# Comps	Min	Max	Mean	Std Dev	CV
Au opt	1003	0.0001	239.7	5.123	17.515	3.4188
Ag ppm	831	0.0073	131.8	2.854	10.602	3.7145

Histogram and probability plots for assays and composites are shown in Figure 14-6 through Figure 14-9.

Figure 14-6 Gold Assay Histogram

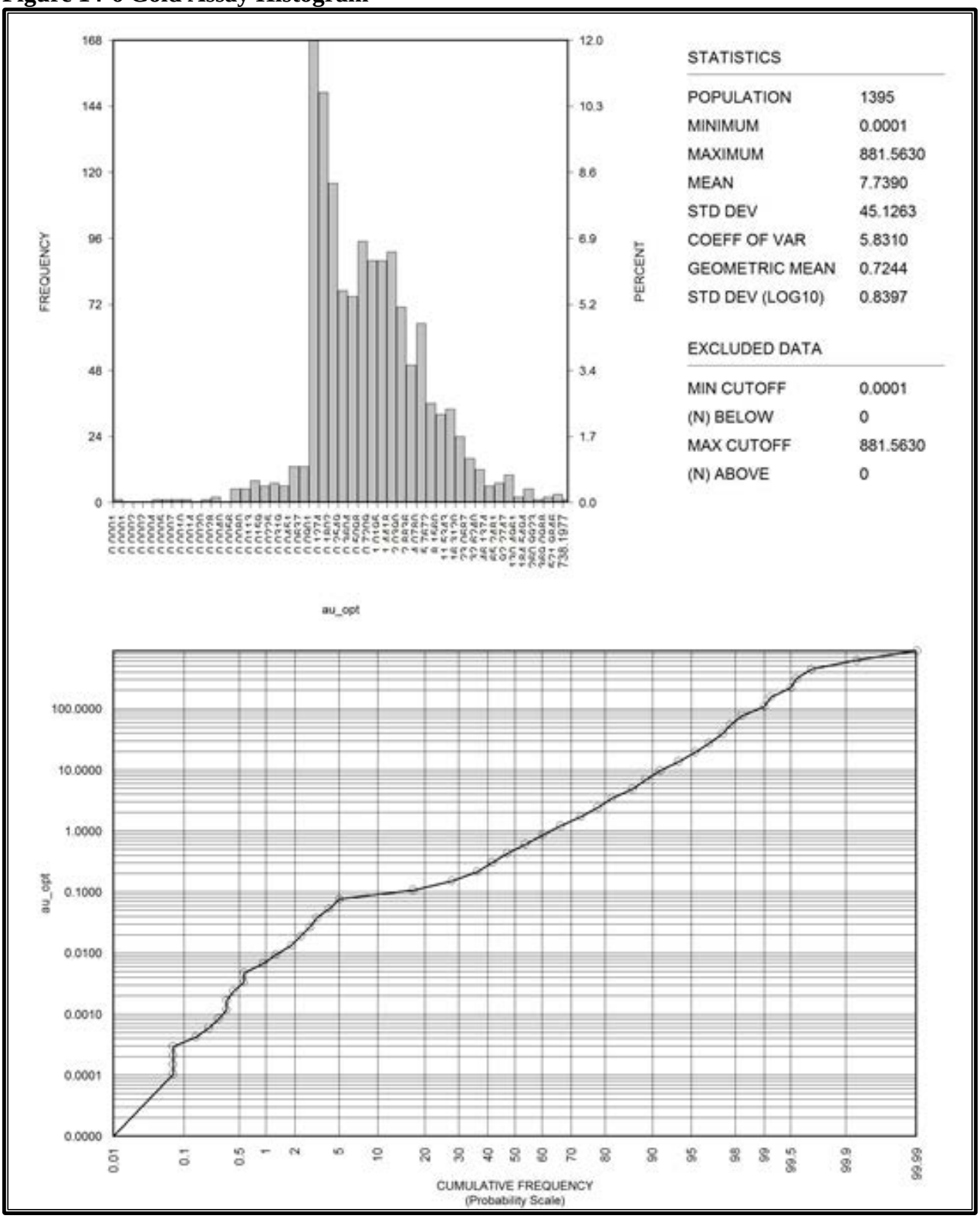


Figure 14-7 Silver Assay Histogram

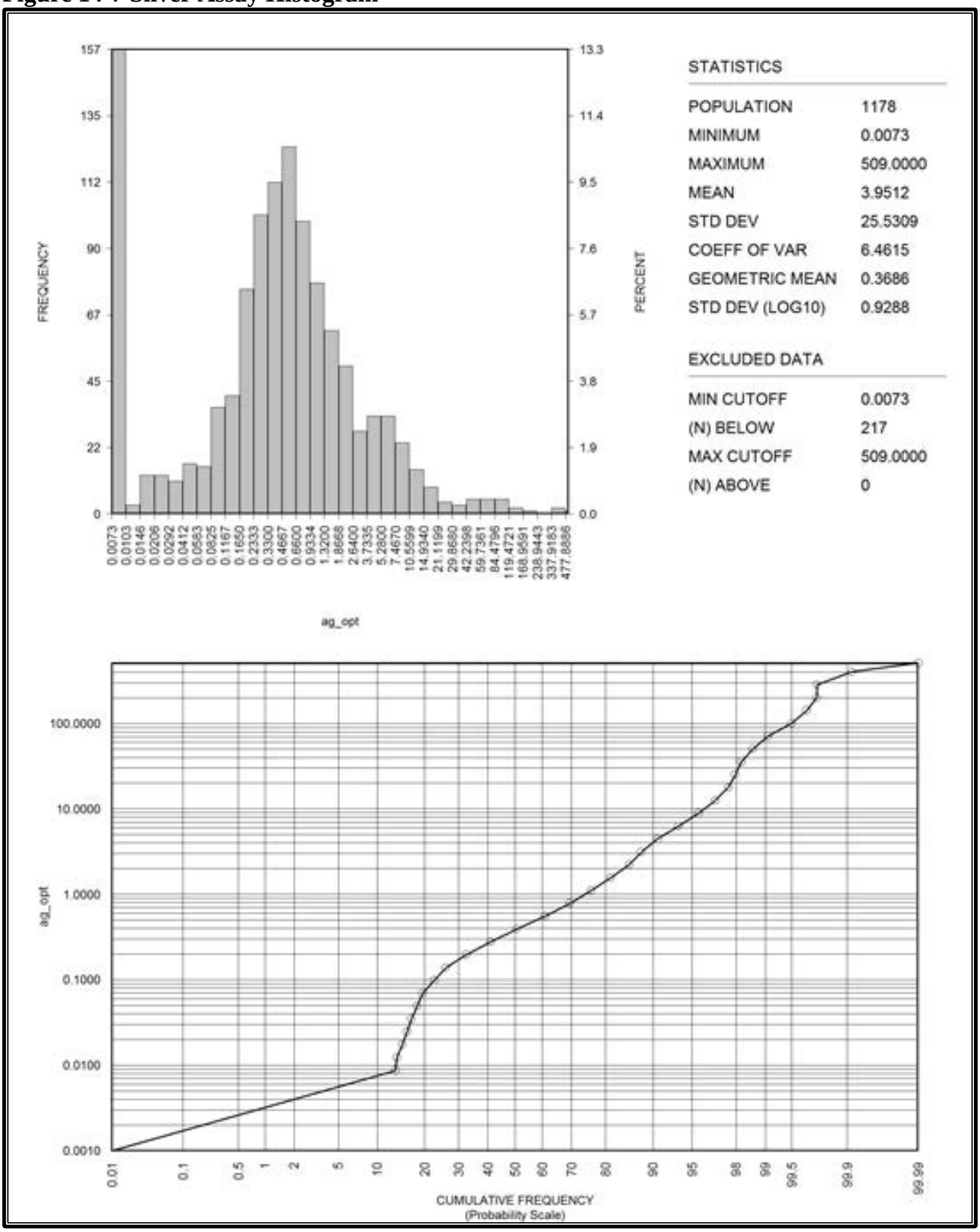


Figure 14-8 Gold Composite Histogram

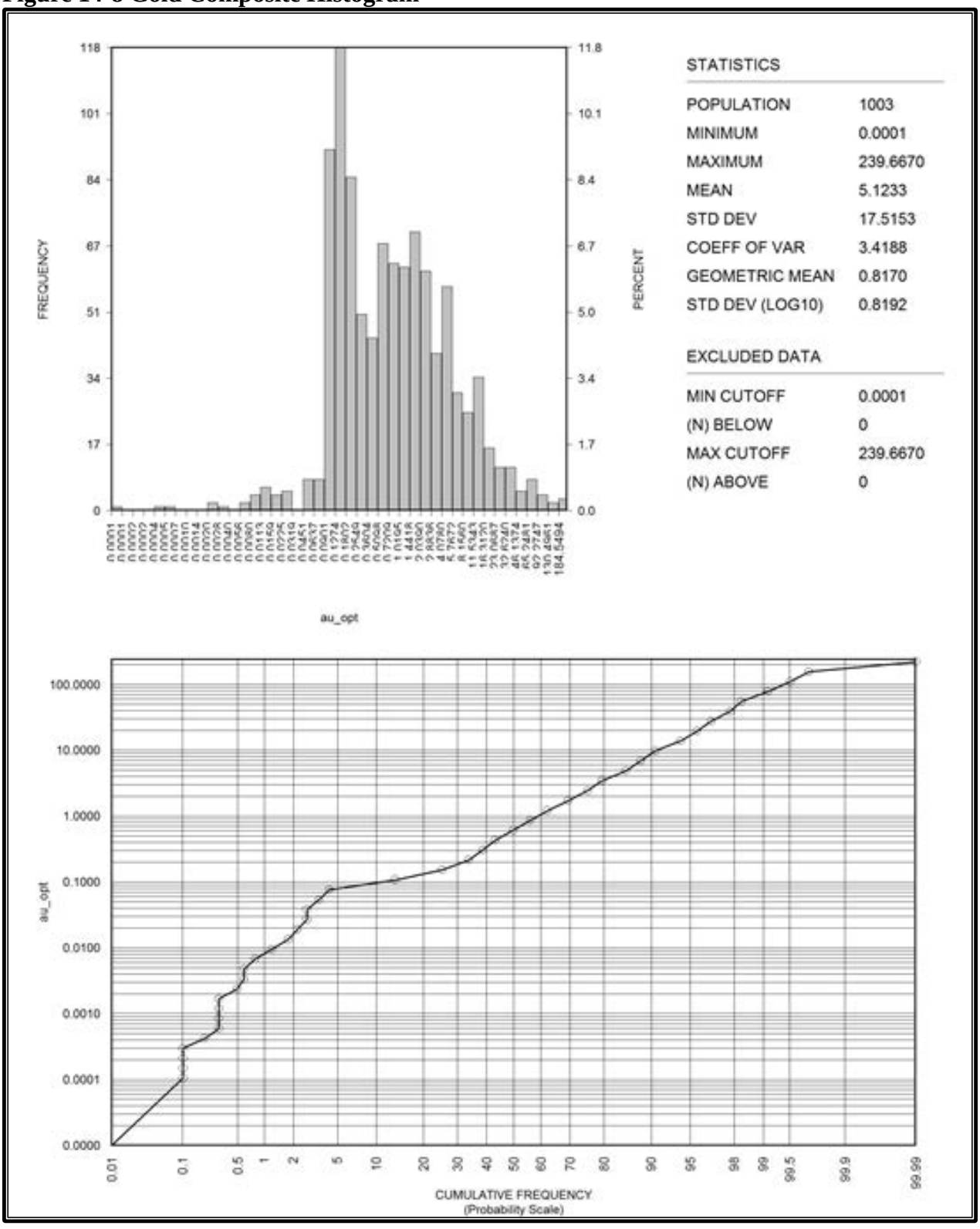
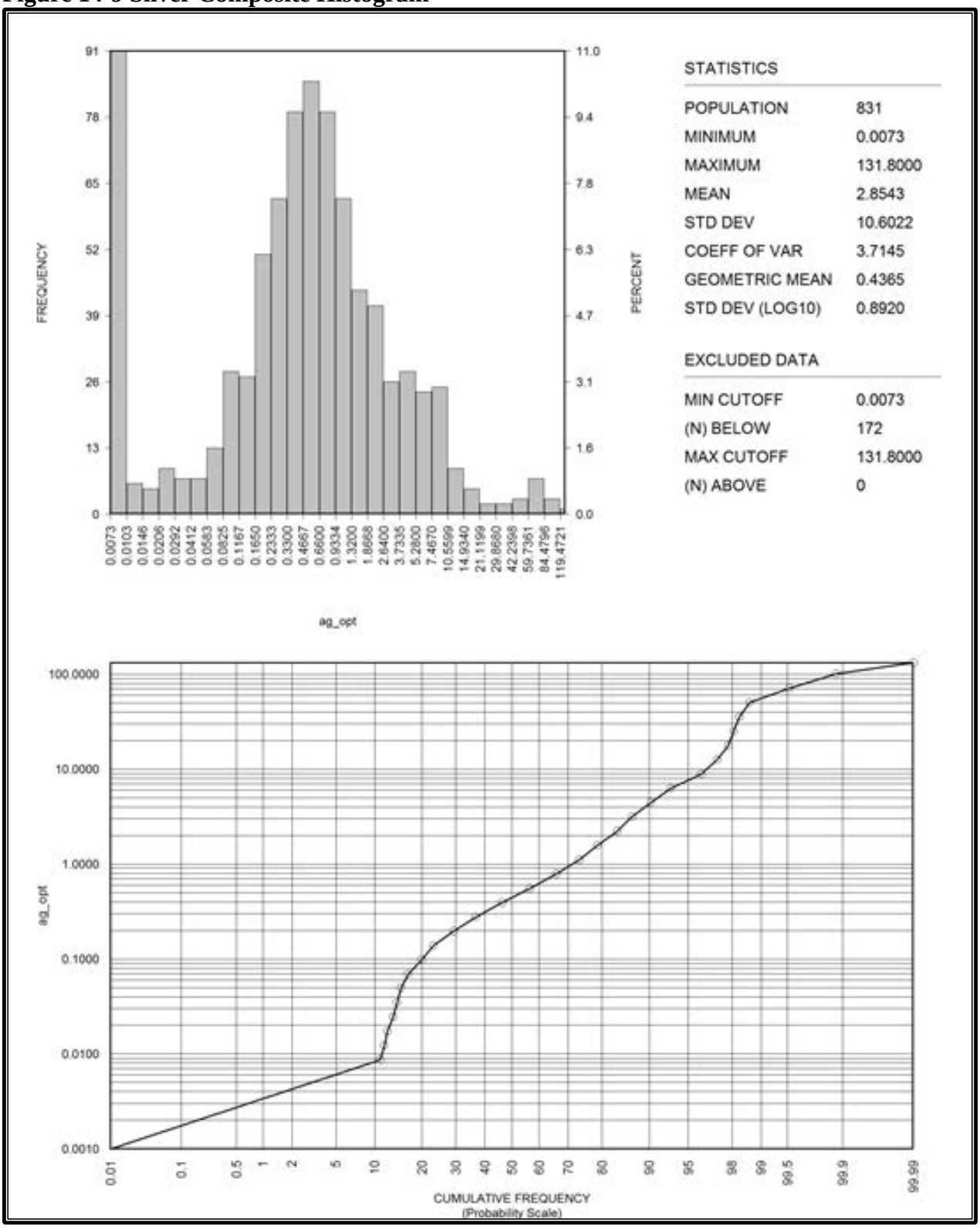


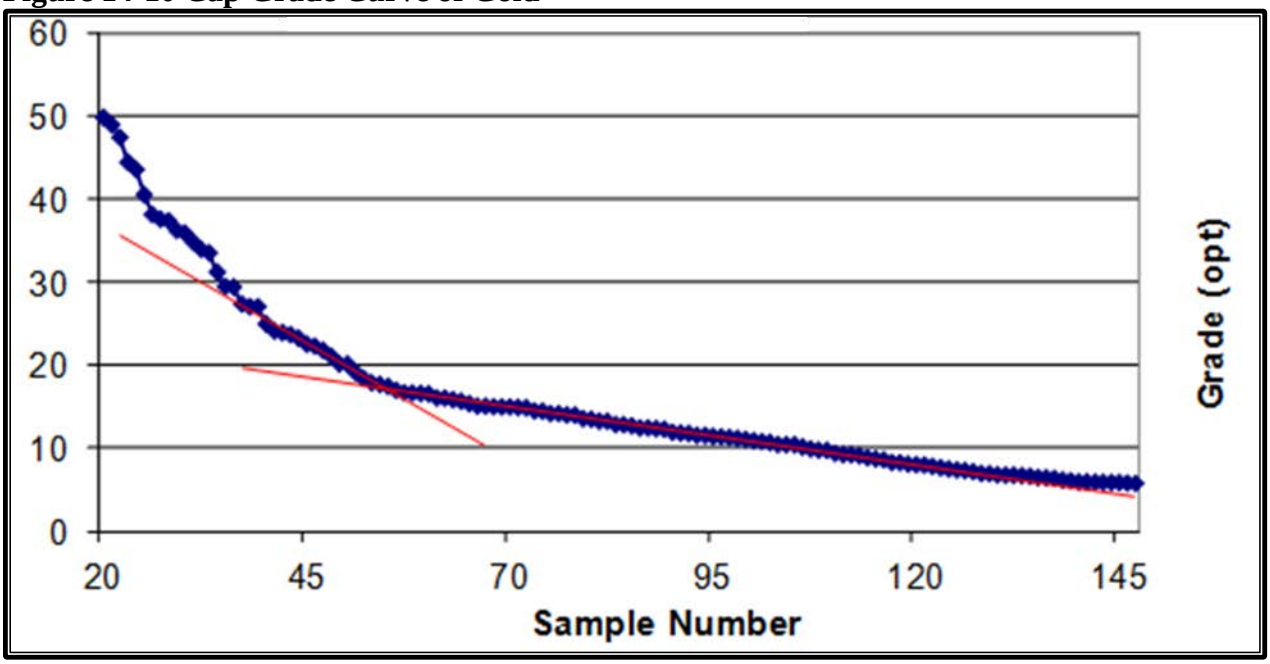
Figure 14-9 Silver Composite Histogram



14.5.1 Grade Capping

The distribution of gold composite grades for opt Au is shown in Figure 14-10. There is a break in the distribution near 19.0 opt affecting 51 composites with values exceeding the grade cap.

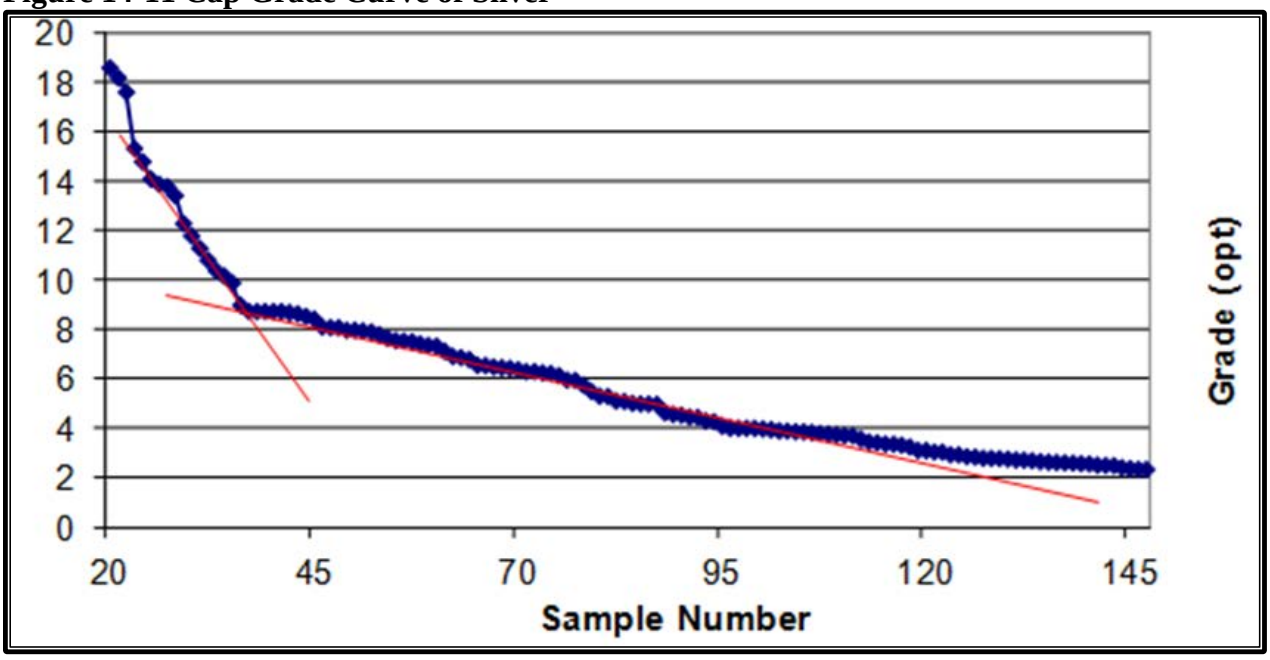
Figure 14-10 Cap Grade Curve of Gold



The grade cap was incorporated into the model using a block approach. Values greater than the cap are used in the estimation but are restricted by an area of influence based on a search radius of five by five by ten feet. Therefore, a block center must be within five feet of a composite with grade greater than 19.0 opt, which is measured from the composite to block center for the grade estimation.

The distribution of silver composite grades is shown in Figure 14-11. There is a break in the distribution near 9.0 opt affecting 36 composites with values exceeding the grade cap. The same capping strategy used for gold composites was also applied to silver composites.

Figure 14-11 Cap Grade Curve of Silver



14.5.2 Variography

Variograms were calculated in SAGE2001 (SAGE) software using the auopt channel and drill hole composites within the veins. The variogram models use a custom LLL-ZYX output from SAGE. The nugget and structure parameters for Fire Creek are summarized in Table 14-5. The representative variogram plots are in Figure 14-12 and Figure 14-13. There are an insufficient numbers of intercepts to calculate reliable kriging parameters, therefore, ordinary kriging estimation was not performed in this analysis.

Table 14-5 Variogram Parameters for Fire Creek Project

Nugget ==> 0.306
C1 ==> 0.203
C2 ==> 0.492
First Structure -- Exponential with Practical Range
1st rotation about the Z axis ==> -36
2nd rotation about the Y' axis ==> 20
3rd rotation about the X' axis ==> 58
Range along the Z' axis 30.3 Azimuth 312 Dip 30
Range along the Y' axis 69.4 Azimuth 353 Dip -53
Range along the X' axis 8.5 Azimuth 54 Dip 20
Second Structure -- Exponential with Practical Range
1st rotation about the Z axis ==> -40
2nd rotation about the Y' axis ==> -103
3rd rotation about the X' axis ==> -18
Range along the Z' axis 16.6 Azimuth 69 Dip -12
Range along the Y' axis 215.2 Azimuth 338 Dip -4
Range along the X' axis 123.7 Azimuth 230 Dip -77

Figure 14-12 Fire Creek Modeled Variogram (0,0)

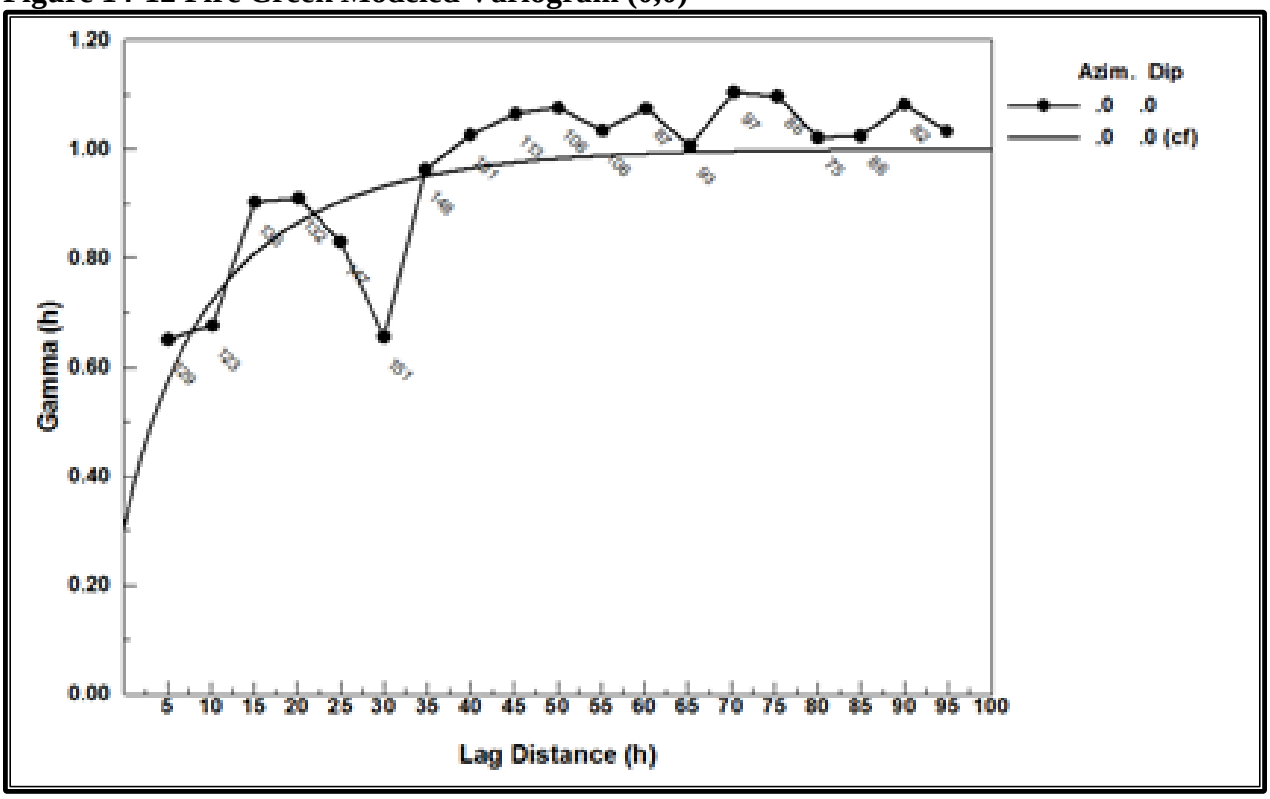
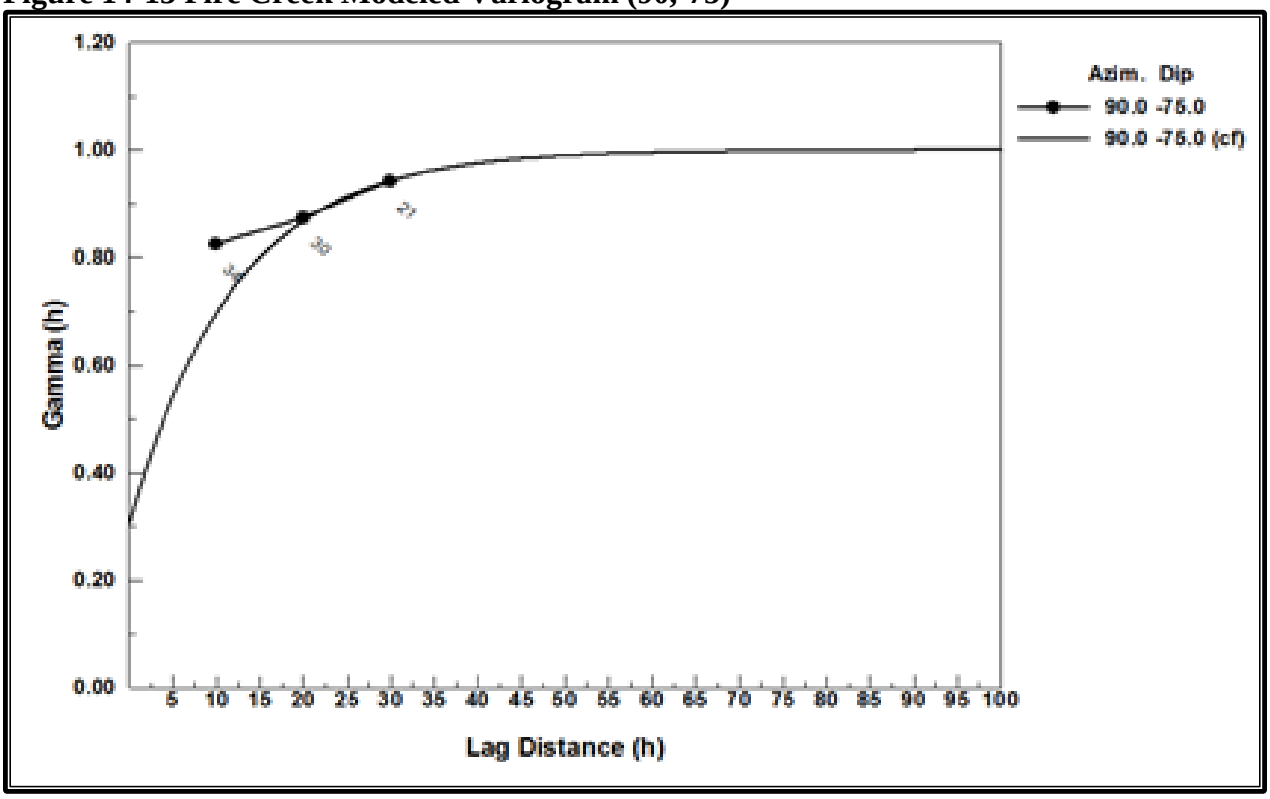


Figure 14-13 Fire Creek Modeled Variogram (90,-75)



14.6 Block Modeling

The block model was constructed by using a 3500 x 5 x 5 foot parent block size (XYZ), and a 0.5 x 5 x 5 foot sub-block size. This modeling method creates a single block across the vein in the X direction within a tolerance of 0.5 feet; therefore, the block width across the vein is within 0.5 feet of the actual width of the vein solid. The model was rotated with the X-axis oriented N75W. The block model origin (lower left corner) is 1736000E, 14693000N, 4600EL. The X length is 3,500 feet, Y length is 7,500 feet and the Z length is 1,400 feet.

The vein names (vein01, vein02, etc.) are stored in the vein variable. Vein blocks are combined into a single name "vn" in the zone variable, whereas the low-grade blocks outside of the veins are called "tuff" or “none”.

14.7 Gold Grade Estimation and Mineral Resource Classification

The gold and silver grade variables, au_id3 and ag_id3, in the block model were estimated using inverse distance cubed, and the variables au_nn and ag_nn were estimated with the nearest neighbor method. The inverse distance cubed estimations were done in three passes. The first pass estimated the blocks classified measured, and these were named "meas" in the class name variable. The second pass estimated the indicated blocks, and these blocks were named "ind" in the class name variable. The last pass estimated the inferred blocks which were named “inf” in the class name variable.

Anisotropic search parameters of gold were set to the average orientation of the veins. Distances were selected based on the spacing of sample intervals intercepting the solid, and on the general orientation and shape of the interpreted veins. The largest search distance was chosen to ensure that all of the blocks inside the vein solids were estimated with gold grade. The waste blocks external of the veins were not estimated.

The gold and silver classification parameters for each of the passes are listed in Table 14-6. The search ellipse orientations for each vein are listed in Table 14-7.

Table 14-6 Estimation Parameters by Pass

Domain	Pass	Parent X	Parent Y	Parent Z	Major (ft)	Semi (ft)	Minor (ft)	Min Samp	Max Samp	Max /DH	Cap Grade
in zone (vn)	meas	10	10	10	25	25	25	5	12	1	19.0
in zone (vn)	ind	10	10	10	100	100	50	2	12	1	19.0
in zone (vn)	inf	10	10	10	1000	1000	50	2	12	2	19.0

Table 14-7 Vein Search Ellipse Orientations

Vein	Est ID	Bearing	Plunge	Dip
vein01_mar2014.00t	vn01	355	0	-90
vein02_mar2014.00t	vn02	335	0	-90
vein03_mar2014.00t	vn03	350	0	-90
vein04_mar2014.00t	vn04	345	0	-90
vein05_mar2014.00t	vn05	347	0	64
vein06_mar2014.00t	vn06	341	0	83
vein07_mar2014.00t	vn07	0	0	70
vein08_mar2014.00t	vn08	340	0	80
vein09_mar2014.00t	vn09	325	0	-83
vein10_mar2014.00t	vn10	347	0	50
vein11_mar2014.00t	vn11	344	0	80
vein12_mar2014.00t	vn12	345	0	77
vein13_mar2014.00t	vn13	340	0	-90
vein14_mar2014.00t	vn14	331	0	-90
vein15_mar2014.00t	vn15	345	0	-90
vein16_mar2014.00t	vn16	317	0	87
vein17_mar2014.00t	vn17	350	0	-90
vein18_mar2014.00t	vn18	292	0	-87
vein19_mar2014.00t	vn19	340	0	-90
vein20_mar2014.00t	vn20	337	0	-90
vein21_mar2014.00t	vn21	349	0	82
vein22_mar2014.00t	vn22	325	0	-66
vein23_mar2014.00t	vn23	350	0	82
vein24_mar2014.00t	vn24	345	0	80
vein25_mar2014.00t	vn25	343	0	77
vein26_mar2014.00t	vn26	345	0	75
vein27_mar2014.00t	vn27	343	0	81
vein28_mar2014.00t	vn28	335	0	-74
vein29_mar2014.00t	vn29	340	0	-70
vein30_mar2014.00t	vn30	335	0	-72
vein31_mar2014.00t	vn31	359	0	-90
vein32_mar2014.00t	vn32	6	0	-90
vein33_mar2014.00t	vn33	345	0	67
vein34_mar2014.00t	vn34	312	0	-90
vein35_mar2014.00t	vn35	344	0	70
vein99_mar2014.00t	vn99	345	0	-90

Significant parameters used in the gold and silver interpolation include:

1. Assigning of parent block values to sub-blocks. Estimates were only calculated at the center of each ten-foot by ten-foot by ten-foot block, and those values were assigned to all sub-blocks existing within the parent block space;
2. Only composites with a value >=0 were used;



3. A minimum of five and maximum of 12 samples were used to estimate measured blocks, minimum (min) of two and maximum (max) of 12 to estimate indicated, and min of two and max of 12 to estimate inferred blocks;
4. A maximum of two composites were used per drill hole;
5. Composites were selected using anisotropic distances;
6. Only composites within the veins were used to estimate blocks within the veins; and
7. Grades were capped (search restricted) at 19.0 opt for gold and 9.0 opt for silver.

Gold and silver grades for blocks outside of the veins were not estimated.

Some variables in the block model were populated using calculation scripts (bcf). The bcfs used in this estimate in the order that they were run are shown below.

Table 14-8 Script File Descriptions

Variable name	Script file name	Description
zone	fc01zone_mar2014.bcf	Assigns the value "waste" to all blocks not assigned to veins
rock	Fc01rock_mar2014.bcf	Assigns rock type values to waste and vein blocks
density	fc03density_mar2014.bcf	Assigns the density value 0.0774 tons/ft3 to all vein blocks.
class	fc04class_mar2014.bcf	Assigns the resource class name value using the estimation flag.

14.8 Mined Depletion and Sterilization

The model was depleted using the as-built surveys of the underground workings. Blocks were labeled “asb” if the block centroid lies within the underground workings.

14.9 Block Model Validation

Table 14-9 shows the mineral inventory calculated with the inverse distance cubed method, and Table 14-10 shows the mineral inventory calculated with nearest neighbor method.

Table 14-9 Fire Creek Project Inverse Distance Cubed Gold Mineral Inventory

	Measured			Indicated			Measured and Indicated			Inferred		
Cut-off (opt)	Mass (000's Short Tons)	Grade (opt)	Gold (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Gold (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Gold (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Gold (000's oz.)
0.0	8.1	3.754	30.3	355	0.810	288	363	0.875	318	1,017	0.518	527
0.1	8.0	3.802	30.3	343	0.837	287	351	0.904	317	1,002	0.525	526
0.2	7.5	4.049	30.2	232	1.165	270	240	1.255	301	658	0.717	472
0.3	7.4	4.075	30.2	161	1.570	253	169	1.680	284	457	0.925	423
0.4	7.3	4.153	30.2	136	1.803	245	143	1.922	275	326	1.158	378
0.5	7.1	4.228	30.1	121	1.971	238	128	2.097	268	257	1.350	347
0.6	6.9	4.353	30.0	106	2.162	230	113	2.295	260	216	1.502	325
0.7	6.7	4.441	29.9	95	2.350	223	101	2.489	252	187	1.637	306
0.8	6.5	4.568	29.7	86	2.515	216	92	2.659	246	161	1.782	286
0.9	6.4	4.650	29.6	80	2.639	211	86	2.787	240	138	1.936	267
1.0	6.2	4.736	29.4	74	2.770	205	80	2.922	235	120	2.087	250
1.5	5.6	5.116	28.7	53	3.386	180	59	3.551	209	67	2.800	187
2.0	5.0	5.498	27.7	42	3.806	161	47	3.986	189	44	3.354	147
2.5	4.3	6.051	26.0	32	4.337	137	36	4.542	163	27	4.030	110
3.0	3.6	6.734	24.0	23	4.909	114	27	5.151	138	18	4.700	85
4.0	2.8	7.642	21.3	15	5.755	84	17	6.058	105	10	5.875	56
5.0	1.8	9.253	16.9	8	6.686	57	10	7.142	74	6	6.875	39
10.0	0.3	24.095	7.1	0	11.481	4	1	17.127	11	0.5	11.246	6

Table 14-10 Fire Creek Project Nearest Neighbor Gold Mineral Inventory

	Measured			Indicated			Measured and Indicated			Inferred		
Cut-off (opt)	Mass (000's Short Tons)	Grade (opt)	Gold (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Gold (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Gold (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Gold (000's oz.)
0.0	8.1	2.919	23.6	355	0.751	267	363	0.799	290	1,017	0.535	544
0.1	7.7	3.057	23.5	323	0.822	265	330	0.874	289	912	0.590	538
0.2	5.9	3.954	23.3	194	1.274	247	200	1.353	270	470	1.004	472
0.3	5.8	4.037	23.2	126	1.831	230	132	1.928	253	289	1.480	428
0.4	5.7	4.065	23.2	107	2.092	224	113	2.192	247	240	1.714	411
0.5	5.4	4.257	23.1	101	2.184	221	107	2.289	245	209	1.902	398
0.6	5.3	4.353	23.0	89	2.418	215	94	2.527	238	177	2.148	381
0.7	5.1	4.517	22.9	77	2.704	207	82	2.817	230	150	2.424	363
0.8	4.9	4.646	22.8	69	2.923	201	74	3.038	224	125	2.750	345
0.9	4.6	4.909	22.5	64	3.078	197	69	3.200	220	116	2.912	337
1.0	4.4	5.105	22.3	63	3.109	196	67	3.238	218	115	2.921	336
1.5	3.3	6.314	21.1	45	3.860	174	48	4.029	195	70	4.004	281
2.0	2.9	7.058	20.2	35	4.448	156	38	4.645	176	58	4.440	260
2.5	2.6	7.618	19.5	29	4.901	142	31	5.122	161	46	5.048	231
3.0	2.2	8.324	18.6	20	5.766	118	23	6.019	136	37	5.604	207
4.0	1.9	9.115	17.6	15	6.606	101	17	6.889	118	20	7.490	153
5.0	1.6	10.054	16.1	13	7.006	89	14	7.347	106	15	8.397	128
10.0	0.5	18.115	8.5	2	12.802	21	2	13.981	29	4.2	12.934	54



Table 14-11 Fire Creek Project Inverse Distance Cubed Silver Mineral Inventory

	Measured			Indicated			Measured and Indicated			Inferred		
Cut-off (opt)	Mass (000's Short Tons)	Grade (opt)	Silver (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Silver (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Silver (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Silver (000's oz.)
0.0	8.1	2.080	16.8	355	0.648	230	363	0.680	247	1,017	0.386	392
0.1	7.4	2.275	16.8	307	0.743	228	314	0.779	245	842	0.454	382
0.2	7.1	2.361	16.7	275	0.812	223	282	0.851	240	636	0.553	352
0.3	6.9	2.408	16.7	225	0.937	211	232	0.981	227	450	0.679	305
0.4	6.9	2.411	16.7	176	1.100	194	183	1.150	210	310	0.829	257
0.5	6.7	2.460	16.6	142	1.254	179	149	1.309	195	238	0.946	225
0.6	6.5	2.532	16.5	114	1.432	163	120	1.491	179	185	1.060	196
0.7	6.3	2.593	16.3	89	1.648	147	95	1.710	163	136	1.209	164
0.8	6.0	2.673	16.1	73	1.846	135	79	1.909	151	95	1.406	134
0.9	5.7	2.768	15.9	64	1.979	128	70	2.043	143	70	1.603	113
1.0	5.4	2.887	15.5	58	2.103	121	63	2.170	137	53	1.820	96
1.5	4.1	3.412	14.0	35	2.668	94	39	2.746	108	26	2.509	64
2.0	3.0	3.997	12.1	24	3.122	74	27	3.221	86	16	2.994	47
2.5	2.3	4.568	10.5	16	3.573	56	18	3.700	67	9	3.561	32
3.0	1.5	5.540	8.3	11	3.992	42	12	4.183	51	5	4.094	22
4.0	0.7	8.367	5.5	3	5.087	17	4	5.617	23	2	5.185	10
5.0	0.4	10.488	4.4	2	5.920	9	2	6.923	13	1	5.922	6
10.0	0.1	33.366	2.4				0.1	33.366	2			

Table 14-12 Fire Creek Project Nearest Neighbor Silver Mineral Inventory

	Measured			Indicated			Measured and Indicated			Inferred		
Cut-off (opt)	Mass (000's Short Tons)	Grade (opt)	Silver (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Silver (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Silver (000's oz.)	Mass (000's Short Tons)	Grade (opt)	Silver (000's oz.)
0.0	8.1	1.739	14.0	355	0.673	239	363	0.697	253	1,017	0.393	400
0.1	6.4	2.190	14.0	271	0.875	237	277	0.905	251	658	0.587	386
0.2	5.7	2.426	13.9	235	0.982	231	241	1.016	245	499	0.725	362
0.3	5.3	2.612	13.8	194	1.138	221	199	1.177	235	394	0.852	336
0.4	5.0	2.722	13.7	151	1.361	206	157	1.405	220	292	1.032	302
0.5	4.5	2.995	13.5	119	1.611	191	123	1.661	205	229	1.193	274
0.6	4.4	3.072	13.4	100	1.804	181	105	1.857	195	165	1.446	239
0.7	4.2	3.152	13.3	81	2.085	169	85	2.138	182	125	1.704	214
0.8	3.9	3.335	13.1	68	2.343	159	72	2.397	172	94	2.020	190
0.9	3.8	3.426	13.0	59	2.574	151	62	2.626	164	75	2.308	174
1.0	3.5	3.600	12.7	52	2.773	145	56	2.825	158	59	2.699	158
1.5	2.9	4.121	11.9	32	3.801	120	35	3.828	132	33	3.901	127
2.0	2.2	4.823	10.7	25	4.380	109	27	4.416	120	22	4.928	110
2.5	1.6	5.780	9.4	19	5.007	96	21	5.067	106	20	5.229	105
3.0	1.3	6.558	8.5	16	5.549	87	17	5.626	95	19	5.437	101
4.0	1.0	7.520	7.4	11	6.225	70	12	6.329	77	13	6.075	80
5.0	0.8	8.228	6.6	8	6.959	55	9	7.076	62	0.01	6603.9	67
10.0	0.02	47.421	0.9				0.02	47.421	1			



On a global basis, the estimation methods compare well with each other, and the average grade of the composites within the grade shells compares favorably with the average grade of the blocks. The composites grade is higher than the block estimations, as is expected. The comparisons for gold and silver are shown in Table 14-13 and Table 14-14.

Table 14-13 Fire Creek Project Gold Grade Comparison

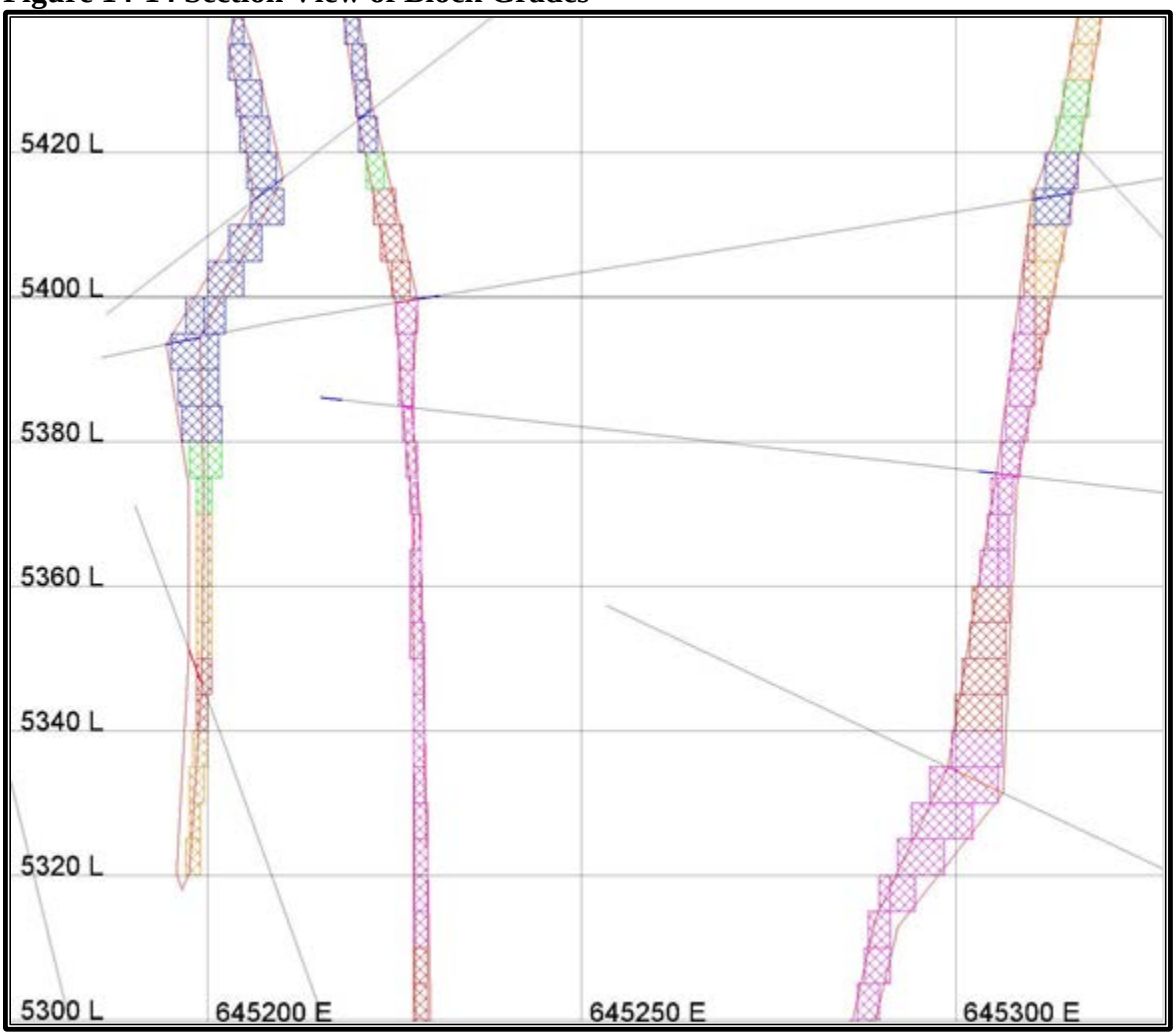
Source	Cut-off Grade (opt)	Avg Gold Grade (opt)	Mass (Tons 000's)	Contained Gold (Oz. 000's)
block au id3	0	0.62	1,382	855.5
block au nn	0	0.61	1,382	844.4
composite au opt	0	5.12		

Table 14-14 Fire Creek Project Silver Grade Comparison

Source	Cut-off Grade (opt)	Avg Silver Grade (opt)	Mass (Tons 000's)	Contained Silver (Oz. 000's)
block ag id3	0	0..47	1.382	646.8
block ag nn	0	0.48	1,382	659.2
composite ag opt	0	2.85		

On a local scale, composite grades compare well with the blocks around the composites, as indicated by the cross section in Figure 14-14 where the block and drill color schemes are the same.

Figure 14-14 Section View of Block Grades



14.10 Mineral Resource Statement

Table 14-15 Fire Creek Project Measured and Indicated Mineral Resources by Vein

Class	Measured					Indicated					Measured + Indicated				
Vein	Mass (000's Short	Au Grade (opt)	Ag Grade (opt)	Cont. Gold (000's oz.)	Cont. Silver (000's oz.)	Mass (000's Short	Au Grade (opt)	Ag Grade (opt)	Cont. Gold (000's oz.)	Cont. Silver (000's oz.)	Mass (000's Short	Au Grade (opt)	Ag Grade (opt)	Cont. Gold (000's oz.)	Cont. Silver (000's oz.)
Vein 01 Vonnie	7	2.13	1.35	14.1	8.9	53	1.43	1.05	75.9	55.8	53	1.43	1.05	75.9	55.8
Vein 02 Joyce	14	1.53	1.01	21.3	14.0	43	1.89	1.11	81.5	47.8	43	1.89	1.11	81.5	47.8
Vein 03						5	0.39	0.66	1.9	3.2	5	0.39	0.66	1.9	3.2
Vein 04						12	0.84	0.49	9.8	5.7	12	0.84	0.49	9.8	5.7
Vein 05						2	0.55	1.66	1.0	2.9	2	0.55	1.66	1.0	2.9
Vein 06						6	0.86	0.62	5.2	3.8	6	0.86	0.62	5.2	3.8
Vein 07						0	0.27	0.34	0.1	0.1	0	0.27	0.34	0.1	0.1
Vein 08	0	2.64	1.18	0.2	0.1	9	2.05	1.08	18.4	9.7	9	2.06	1.08	18.6	9.8
Vein 09											-			-	-
Vein 11						5	0.55	1.49	2.9	7.9	5	0.55	1.49	2.9	7.9
Vein 12											-			-	-
Vein 13	1	0.95	0.74	1.3	1.0	3	0.86	0.51	2.5	1.5	4	0.89	0.58	3.8	2.5
Vein 14						11	0.74	0.41	8.5	4.7	11	0.74	0.41	8.5	4.7
Vein 15						2	0.47	0.31	0.9	0.6	2	0.47	0.31	0.9	0.6
Vein 16											-			-	-
Vein 17						4	0.99	0.35	4.0	1.4	4	0.99	0.35	4.0	1.4
Vein 18						0	0.54	0.24	0.2	0.1	0	0.54	0.24	0.2	0.1
Vein 19						6	0.30	0.09	1.7	0.5	6	0.30	0.09	1.7	0.5
Vein 20						4	0.78	0.32	3.1	1.3	4	0.78	0.32	3.1	1.3
Vein 21						6	0.83	0.81	4.9	4.8	6	0.83	0.81	4.9	4.8
Vein 22						3	0.48	0.56	1.4	1.7	3	0.48	0.56	1.4	1.7
Vein 23						1	0.34	0.48	0.5	0.7	1	0.34	0.48	0.5	0.7
Vein 24						9	0.55	0.69	4.7	5.9	9	0.55	0.69	4.7	5.9
Vein 25						2	1.54	0.31	2.9	0.6	2	1.54	0.31	2.9	0.6
Vein 26						1	0.36	0.20	0.5	0.3	1	0.36	0.20	0.5	0.3
Vein 27						7	0.41	0.34	3.1	2.5	7	0.41	0.34	3.1	2.5
Vein 28						0	0.48	0.35	0.2	0.1	0	0.48	0.35	0.2	0.1
Vein 29						2	0.30	0.40	0.5	0.7	2	0.30	0.40	0.5	0.7
Vein 30						10	0.66	0.41	6.7	4.1	10	0.66	0.41	6.7	4.1
Vein 32						1	0.29	0.36	0.4	0.5	1	0.29	0.36	0.4	0.5
Vein 33						0	0.69	0.19	0.2	0.1	0	0.69	0.19	0.2	0.1
Vein 34						2	0.57	0.48	0.9	0.8	2	0.57	0.48	0.9	0.8
Vein 99	0	2.77	1.02	0.2	0.1	2	0.89	0.52	1.9	1.1	2	0.95	0.54	2.1	1.2
Total	22	1.68	1.09	37.1	24.1	213	1.16	0.80	246.5	170.8	214	1.16	0.80	248.2	172.0



Table 14-16 Fire Creek Project Inferred Mineral Resources by Vein

Class	Inferred				
Vein	Mass (000's Short Tons)	Au Grade (opt)	Ag Grade (opt)	Cont. Gold (000's oz.)	Cont. Silver (000's oz.)
Vein 01 Vonnie	*28*	*1.58*	*0.84*	*44.30*	*23.55*
Vein 02 Joyce	*95*	*0.92*	*0.61*	*86.94*	*57.85*
Vein 03	*2*	*1.39*	*1.29*	*2.81*	*2.62*
Vein 04	*20*	*0.30*	*0.34*	*6.09*	*6.88*
Vein 05	*0*	*0.42*	*0.51*	*0.01*	*0.01*
Vein 06	*4*	*0.41*	*0.27*	*1.61*	*1.08*
Vein 07					
Vein 08	*0*	*1.80*	*0.85*	*0.54*	*0.26*
Vein 09	*30*	*1.09*	*0.31*	*32.86*	*9.40*
Vein 11	*12*	*0.38*	*0.75*	*4.40*	*8.60*
Vein 12	*0*	*0.24*	*0.23*	*0.11*	*0.11*
Vein 13					
Vein 14	*44*	*0.46*	*0.22*	*20.14*	*9.51*
Vein 15	*35*	*0.42*	*0.29*	*14.75*	*10.28*
Vein 16	*10*	*0.22*	*0.12*	*2.34*	*1.25*
Vein 17	*20*	*0.78*	*0.35*	*15.88*	*7.19*
Vein 18	*3*	*0.48*	*0.28*	*1.47*	*0.88*
Vein 19	*3*	*0.22*	*0.01*	*0.57*	*0.03*
Vein 20	*14*	*1.29*	*0.70*	*18.27*	*9.89*
Vein 21	*52*	*0.55*	*0.34*	*28.42*	*17.76*
Vein 22	*12*	*0.89*	*0.67*	*10.89*	*8.17*
Vein 23	*24*	*0.47*	*0.25*	*11.31*	*6.12*
Vein 24	*78*	*0.62*	*0.73*	*48.44*	*57.10*
Vein 25	*23*	*0.79*	*0.31*	*18.26*	*7.20*
Vein 26	*39*	*0.42*	*0.16*	*16.28*	*6.18*
Vein 27	*12*	*0.29*	*0.19*	*3.52*	*2.31*
Vein 28	*34*	*0.57*	*0.36*	*19.58*	*12.19*
Vein 29	*5*	*0.30*	*0.34*	*1.37*	*1.52*
Vein 30	*11*	*0.50*	*0.37*	*5.61*	*4.15*
Vein 32	*0*	*0.31*	*0.37*	*0.13*	*0.16*
Vein 33	*0*	*0.57*	*0.16*	*0.04*	*0.01*
Vein 34	*9*	*0.55*	*0.46*	*4.69*	*3.91*
Vein 99	*6*	*0.35*	*0.74*	*2.21*	*4.73*
Total	627	0.68	0.45	423.86	280.88

Notes to mineral resource tables:

1. *Mineral resources, which are not mineral reserves, do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, socio-political, marketing, or other relevant issues.*
2. *The quantity and grade of reported inferred mineral resources in this estimation are uncertain in nature. There has been insufficient exploration to define these inferred mineral resources as an indicated or measured mineral resource. It is uncertain if further exploration will result in upgrading them to an indicated or measured mineral resource category.*

3. *Mineral resources have been estimated at a cut-off grade of 0.227 opt (7.8 g/t) calculated at a $1,250 per ounce gold price and an $18 per ounce silver price.*
4. *The mineral resource estimate is exclusive of mineral reserves. Mineral reserves for the Fire Creek Project have not been established.*

14.11 Other Resource Constraints

Fire Creek is located within the prolific gold producing area of northeastern Nevada. This area has a long history of mining and a significant percentage of the local population is either directly or indirectly engaged in the local mining industry. The local environmental activist groups are not a deterrent to mining but rather make constructive contributions to the permitting process. The authors are not aware of any environmental, legal, political, or socio-economic constraints, which could impact the resource estimate presented herein.

The size, orientation, and depth below surface render the Fire Creek mineral resource amenable to underground narrow vein mining methods similar to those used at the nearby Midas and Hollister mines. Metallurgical testing also indicates the Fire Creek mineral resource will be successfully processed at Klondex's nearby Midas facility.

15 Mining

15.1 Development Mining

15.1.1 Access Development

Mining area accesses will be from haulage drifts, designed to be between 12 to 15 feet wide and between 13 to 17 feet high. Drift grade will vary from – 15% to + 15% to reach the desired elevation. Secondary drifts, spiral ramps and vertical raises will connect the haulage drifts to provide a pathway for ventilation to the surface and serve as a secondary escape way.

Figure 15-1 Existing Development and Vein Traces Incorporated in the Mine Plan

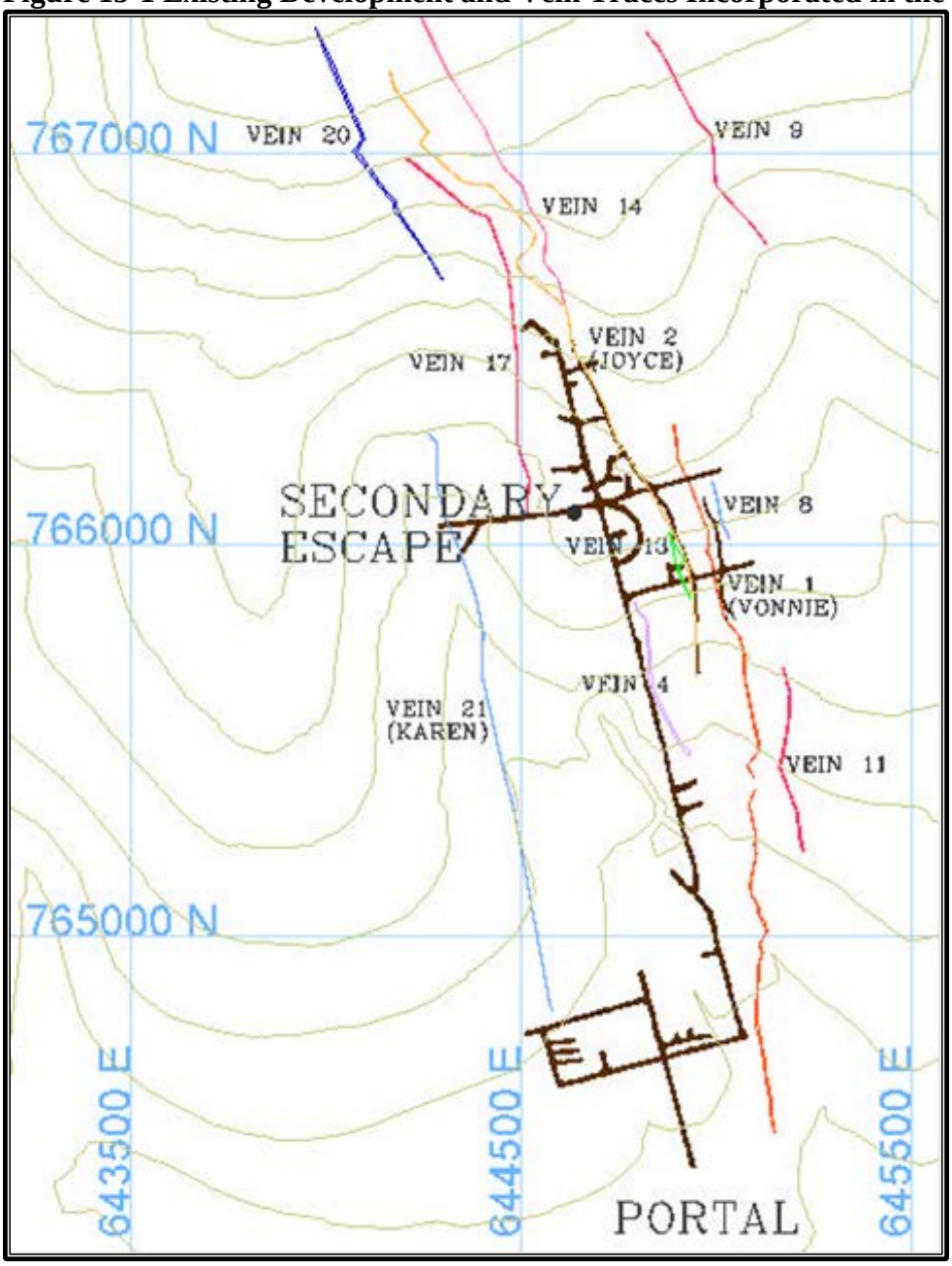


Figure 15-1 and Figure 15-2 show the relationship of the existing decline development, the planned mining areas, and the location of the ventilation and secondary egress raise. One of the planned spiral development ramps, and associated level crosscuts, accessing multiple veins on each level is presented in a zoomed in view in Figure 15-3.

Figure 15-2 Long Section Looking West Showing Existing and Proposed Development and all Planned Stopes

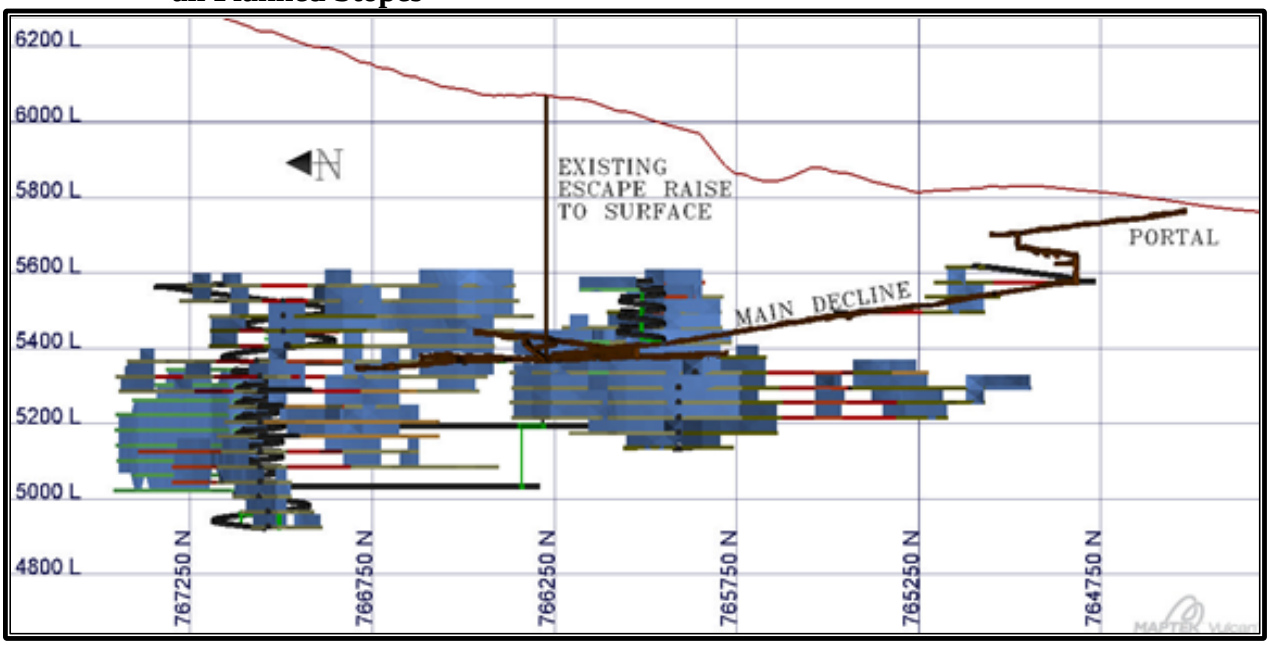


Figure 15-3 Typical Level Access Cross Cutting Multiple Veins



15.1.2 Ground Support

The ground conditions at Fire Creek are typical of the northeastern Nevada extensional tectonic environment. Joint spacing varies from a few inches to a foot or more. To date, split sets and Swellex rock bolts along with welded wire mesh have been successfully employed to control all conditions encountered during decline development. Shotcrete has also been liberally applied to prevent long-term deterioration of the rock mass.

All major access drifts require a minimum of wire mesh and rock bolts for support. Under more extreme conditions, resin anchor bolts, cable bolts, and shotcrete can be used to supplement the primary support. Steel sets and spiling may also be used to support areas with the most severe ground conditions.

15.1.3 Ventilation and Secondary Egress

Underground mining will rely heavily on diesel equipment to extract the mineralized material and waste rock and to transport cemented rock fill to the stopes. Diesel combustion emissions will require large amounts of fresh ventilation air to remove the diesel exhaust and maintain a healthy working environment. A combination of the main access drifts and vertical raises to the surface are arranged in a manner to provide a complete ventilation circuit. The mine portal can be used as either an intake or an exhaust. Air movement will be facilitated by primary ventilation fans placed at the surface or underground in strategic locations. Small auxiliary fans and ducting will draw primary ventilation air directly into the working faces.

The ventilation raise connecting the main decline to the surface is approximately 690 feet in length and is entirely lined with corrugated metal pipe to support the ribs and maintain a uniform cross sectional area. Since the vertical extent of the raise exceeds the maximum 300 feet permitted for a continuous ladder way, it has been equipped with an automatic hoist and personnel capsule for evacuating the mine in the event of an emergency.

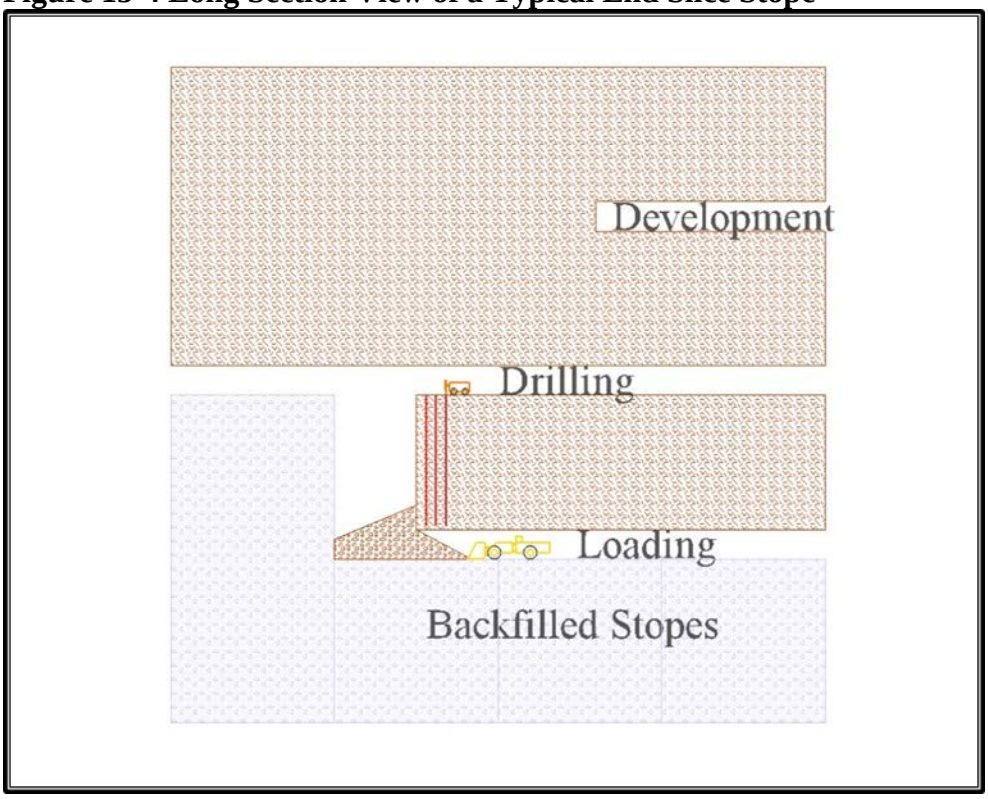
15.2 Mining Methods

Mining at Fire Creek may be completed using any one or a combination of the following three mining methods: end slice stoping with delayed backfill, also referred to as long hole stoping; cut and fill stoping; and shrinkage stoping. The final choice of mining method will depend upon the geometry of the stope block, proximity to main access ramps, ventilation and escape routes, the relative strength or weakness of the mineralized material and adjacent wall rock, and finally the value or grade of the mineralized material. The choice of mining method will not be made until after the stope delineation and definition drilling is completed. Each method will be discussed briefly in the following paragraphs.

15.2.1 End Slice Stoping

End slice, or long hole, stoping has the highest degree of mechanization of the three expected mining methods at Fire Creek, is the lowest cost method and generally provides the lowest total cost per ounce. End slice stoping requires the greatest amount of waste development and incurs the highest level of mineralized material dilution, as compared to other mining methods. The current mine plan incorporates 100% end slice stoping for exploitation of the resource. Figure 15-4 shows a typical end slice stoping arrangement.

Figure 15-4 Long Section View of a Typical End Slice Stope



To prepare an area for end slicing, access for the mobile equipment must be developed to each level. Mine utilities for communication, water, electrical power, and compressed air must also be provided through the access development. Level spacing is limited to 40 feet to control dilution and may be increased if vein geometry, ground conditions, and vein thickness are favorable. Mining will progress upwards from the lowest level of the stope block. Drilling and blasting will be carried out from the drift above the active stope while the broken mineralized material will be removed from the bottom drift. The loader used for excavation may be equipped with remote control to allow the removal of all blasted rock without exposing the operator to the open stope and the potential risk of ground failure.

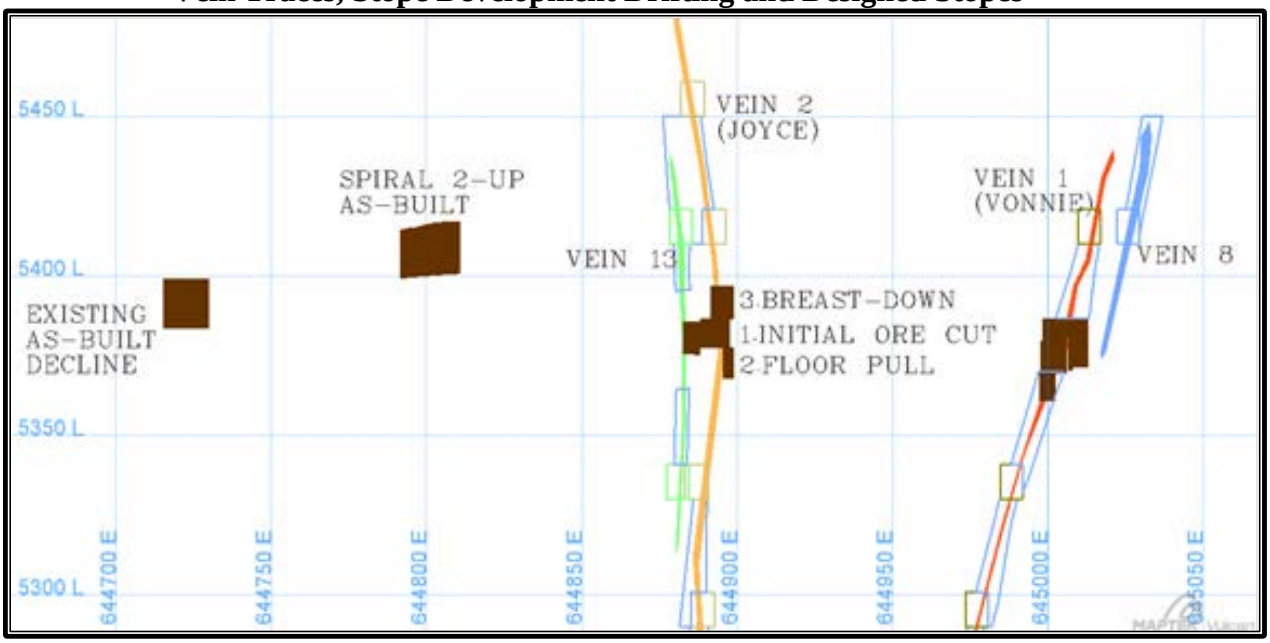
The amount of mineralization that can be removed prior to backfilling will be constrained by the strength of the gangue material and jointing present immediately adjacent to the stope. Backfill, either waste rock or cemented rock fill, will be transported from the surface using the same haulage equipment used to remove mineralized material and waste rock from the mine. Where possible, waste rock will be retained within the mine. The stope will be backfilled from the drift used for drilling and blasting.

Cemented rock fill, which consists of screened mine waste, fly ash, and cement will be mixed on the surface and transported underground in the same trucks used to haul blasted rock to the

surface. Normal backfill unconfined compressive strengths (UCS) of 400 to 600 psi will be achieved by blending a mixture containing up to 4% cement and fly ash. When mining is anticipated to occur below the backfilled stope, the UCS of the fill will be increased up to 1,000 psi by adding up to 8% cementatious binder.

A typical end slice stoping arrangement at Fire Creek is presented in Figure 15-5. Stope development drifting is planned at seven feet wide and 11 feet high to accommodate the production drill. Levels are located at 40-foot vertical intervals to control dilution and may be increased as experience is gained in mining the Fire Creek veins. Stope widths have been designed at either four feet or the horizontal vein thickness plus two feet, whichever is greater. All stope cross sections were calculated using Vulcan stope optimizer software.

Figure 15-5 Cross Section Through the Joyce Vein and Vonnie Vein Showing the Modeled Vein Traces, Stope Development Drifting and Designed Stopes

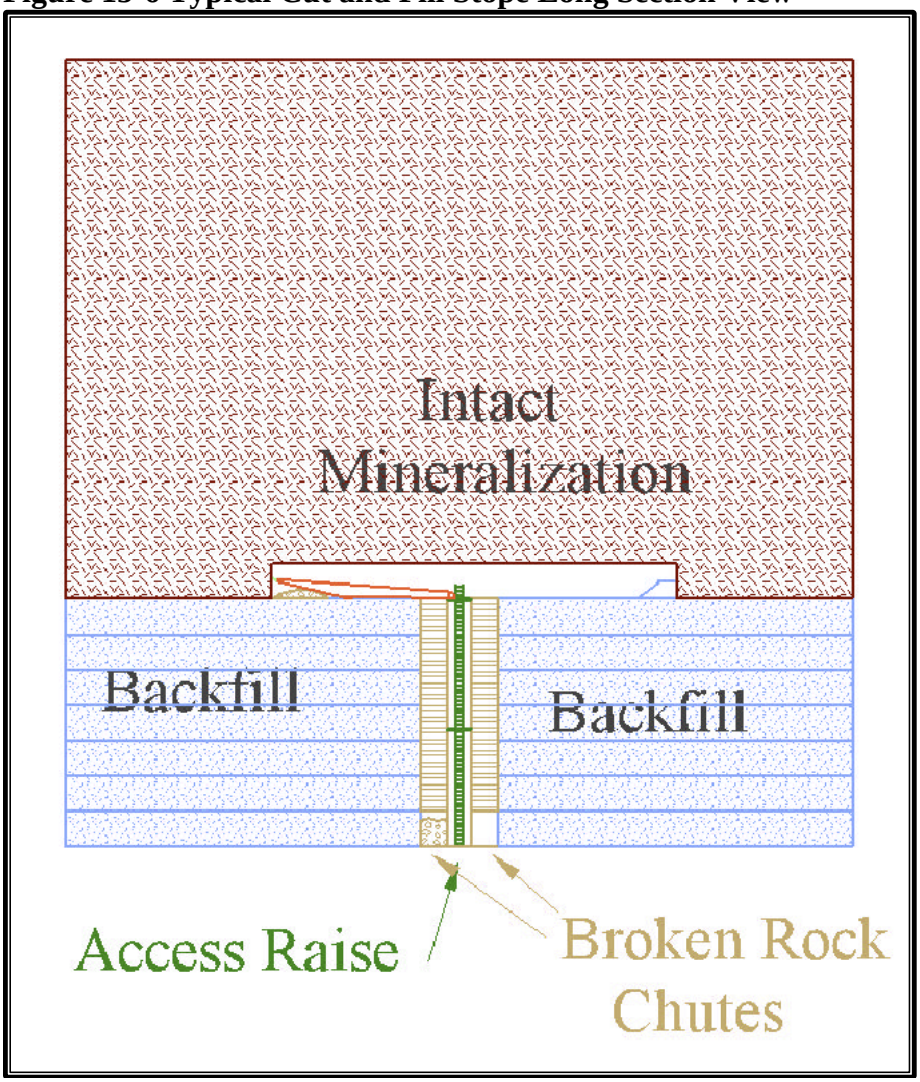


15.2.2 Cut and Fill Stoping

In addition to end slice stoping, two alternative mining methods are applicable to the Fire Creek deposit. These methods are not included in the current mine plan but may be adopted where it is desirable to reduce development, mine irregular veins, or mine veins where the wall rock is too weak for end slice stoping.

Cut and fill stoping is the most labor intensive and highest cost mining method of the three considered methods at Fire Creek. Cut and fill stoping can be used when the rock is weak or when it is desirable to minimize dilution. Variations in the vein geometry are easily handled with this method. A typical cut and fill stope arrangement is shown in Figure 15-6.

Figure 15-6 Typical Cut and Fill Stope Long Section View



A cut and fill stope may extend up to 300 feet from the bottom access and can be less than four feet in thickness. The stope can extend 200 to 300 feet horizontally in each direction from the access raise. The stoping cycle starts with excavating and installing timber for the raise. This raise is then divided into three compartments. The center compartment will be used for material and personnel access, while the end compartments will be used as mineralized material passes.

Blast holes will be drilled with handheld drills. Each blast will remove a cube of rock approximately nine feet high, eight feet deep and four to six feet wide depending upon the vein width. A small electric or compressed air powered scraper will move the blasted rock from the face to the mineralized material pass. Mineralized rock will be removed from the bottom of the mineralized material pass by the mobile equipment fleet and hauled to the surface.

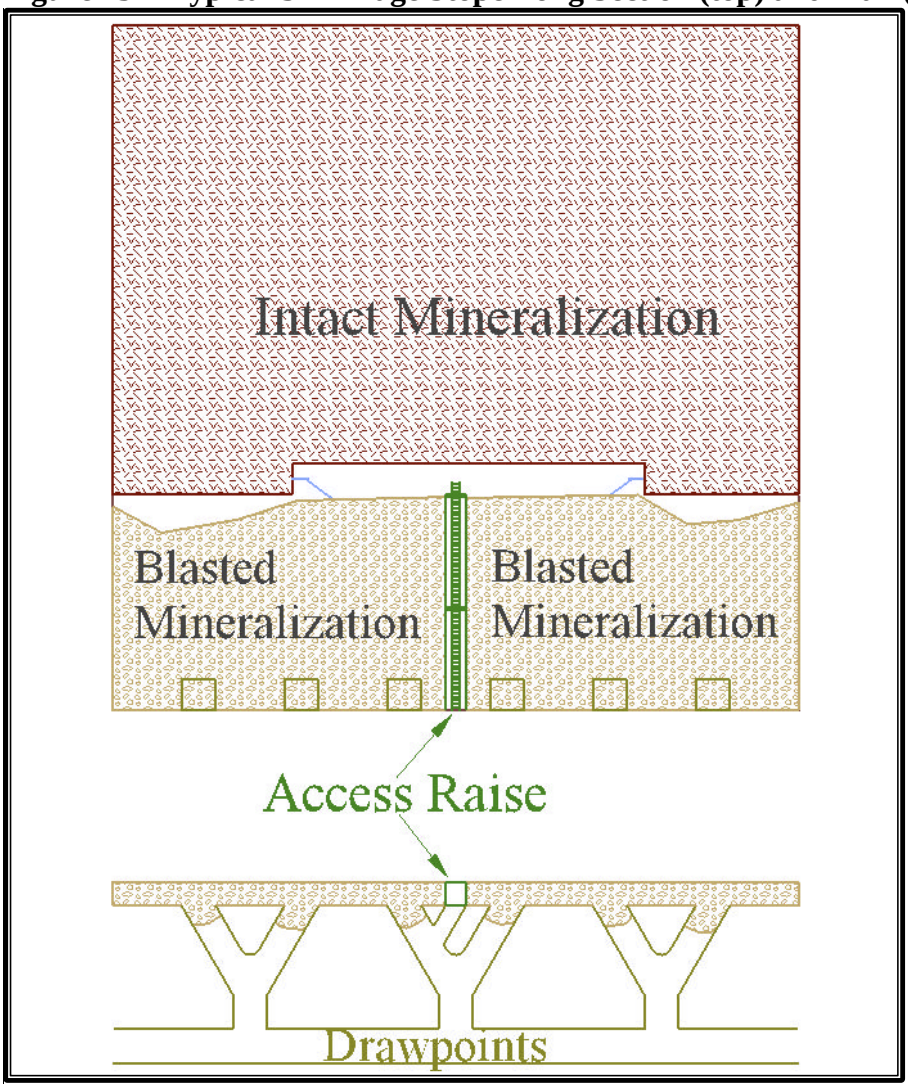
Once the mineralized material excavation reaches the stope boundary, the stope will be backfilled to the level of the intact vein and the process repeated.

The backfill used in this method will contain maximum aggregate sizes of $^{3}/_{8}$ to ½ inch and will be blended with cement, fly ash, and an air entraining additive mixture. The purpose of the additive mixture is to entrap micro air bubbles in the mix and lower the overall backfill density. The backfill will be mixed on the surface and transported underground in the shotcrete remix trucks where it will then be pumped into the stope from the access below.

15.2.3 **Shrinkage Stoping**

Shrinkage stoping is the middle cost alternative of the three mining methods planned. Shrinkage stoping requires moderately competent wall rock, and like cut and fill, can adapt quickly to variations in the vein geometry. The disadvantage of shrink stoping is that $^{2}/_{3}$ of the mineralized material mined must remain in the stope until it is completely blasted. The overall dimensions of a shrinkage stope are comparable to those of cut and fill. A typical shrinkage stoping arrangement is shown in Figure 15-7.

Figure 15-7 Typical Shrinkage Stope Long Section (top) and Plan (bottom)



Shrinkage stoping is initiated by excavating a parallel waste access drift at the bottom of the stope with cross cuts to the vein to serve as draw points. The draw points are spaced at 20 to 25 foot intervals along the full length of the stope. One or two raises are mined and timbered to provide access for personnel and materials. Drilling and blasting is carried out in the same manner as those of the cut and fill stope, described previously. The volume of the mineralized material will swell up to 50% after blasting, and it is this fact that makes shrinkage stoping possible. Following the blast, a volume of mineralized material equal to the swell volume will be withdrawn from the draw points immediately below the blast leaving the original mineralized material volume in the stope to provide a working surface and support the stope walls. Once blasting has reached the upper limit of the stope, the mineralized material remaining can be removed from the draw points leaving the stope empty. The final void will be left open.

15.3 Underground Labor

Peak underground work force requirements for Fire Creek are presented in Table 15-1. This estimate was prepared using productivity rates typical for small-scale mechanized mining in North America. The mine will operate 24 hours per day seven days per week. The mine operations workforce will be divided into four crews scheduled to work 14 out of every 28 days.

Table 15-1 Year 3 Labor Requirements

Job Classification	Count
Miners	45
Mechanics	15
Supervision	6
Technical Staff	12
Manager	1
Total	79

15.4 Mobile Equipment Fleet

Development drifting required in the life of mine plan averages 18 to 20 feet per day during the first three years of mine life. All development is completed during the fourth year. Production rates of 300 tons per day are expected to be achieved by the third year of the plan. Table 15-2 lists the mining fleet requirements necessary to achieve the development and production goals outlined in the life of mine plan. With the acquisition of the Midas Mine from Newmont and the associated reduction in mining rates, several units required at Fire Creek may be sourced from the Midas surplus inventory.

Table 15-2 Underground Mobile Equipment

Description	Count	Comment
2 boom jumbo	1	Transfer from Midas
Single boom jumbo	1	Transfer from Midas
Bolter	1	Transfer from Midas
6 Yard LHD	1	Transfer from Midas
4 Yard LHD	1	
2 Yard LHD	2	Transfer from Midas
15 - 20 ton trucks	2	Transfer from Midas
Stope ring drills	1	Contracted
Shotcrete pump, robotic spray arm and cariier	1	
Shotcrete remix trucks	2	
Underground Electrical Distribution	Lot	
Ventilation Fans	Lot	

16 Mineral Processing

16.1 Midas Mill

The Midas Mill was constructed in 1997 and has a nameplate capacity of 1,200 short tons (st) per day. The mill uses conventional leach technology with Counter Current Decantation (CCD) followed by Merrill Crowe precipitation. Doré is further refined at Johnson Matthey Limited refineries in Utah. Process toll milling has been performed at the Midas mill periodically since 2008. Historically, the gold recovery has ranged from 92% to 97%, and silver recovery from 87% to 93%, depending upon processing rates and ore types. Mill availability for the LOM is estimated at 95%.

Ore is crushed in two stages through a 30-inch by 40-inch primary jaw crusher and 53-inch secondary cone crusher. The products from both the primary jaw crusher and secondary crusher are fed to a six-foot by 20-foot Nordberg double deck vibrating screen fitted with a two-inch top deck and one-half inch bottom deck screen panels to produce a 95% passing through a three-eighths inch product. Magnetic material is removed from the crusher screen feed by a continuous belt self-cleaning magnet to protect the cone crusher from damage. Screen undersize is conveyed to one of two 500-ton fine ore bins.

Ore is transported from the fine ore bins by individual belt feeders into the 10.5-foot by 15-foot rubber lined Nordberg ball mill. The ball mill is charged with a blend of two and a half-inch and three-inch grinding balls to maintain an operating power draw of 800 horse power (HP). Mill discharge pulp is pumped to a nest of four-inch by ten-inch Krebs cyclones (three operational, one for standby) for classification. Cyclone overflow, at 75% to 88% passing 200 mesh, reports to the trash screen. Cyclone underflow reports to a 0.08 inch aperture scalping screen, with the screen undersize being distributed by three-way splitter to the ball mill, tower mill, and gravity circuit. Lead nitrate solution is added to the ball mill feed chute to enhance leach kinetics.

A split of the screened cyclone underflow reports to the 250HP Vertimill for open circuit grinding with the Vertimill discharge overflowing back to the primary ball mill discharge hopper. The Vertimill is charged with one inch grinding balls. A split of the screened cyclone overflow also reports to the 20-inch Knelson concentrator for gravity gold recovery. The Knelson operates on a 60 minute cycle providing concentrate for cyanidation in the CS500 (industry brand name) Acacia Leach Reactor which conducts three 750 to 1,000 kilogram (kg) batch leaches each week. Pregnant solution (batch containing 100 oz on average) from the leach reactor reports to the CCD circuit pregnant solution tank.

Cyclone overflow is screened to remove any plastic debris before reporting to a 42-foot diameter pre-leach thickener. Thickener underflow at 50% solids is pumped to the leach circuit consisting of eight 28-foot by 30-foot air sparged leach tanks, providing a leach residence time of approximately 65 hours. The pH in the first leach tank is maintained between 10.4 to 11.0 through the addition of hydrated lime, produced from the on-site slaking of pebble lime. Sodium cyanide concentration in the second leach tank is maintained at 0.85 gallons per liter (gpL).

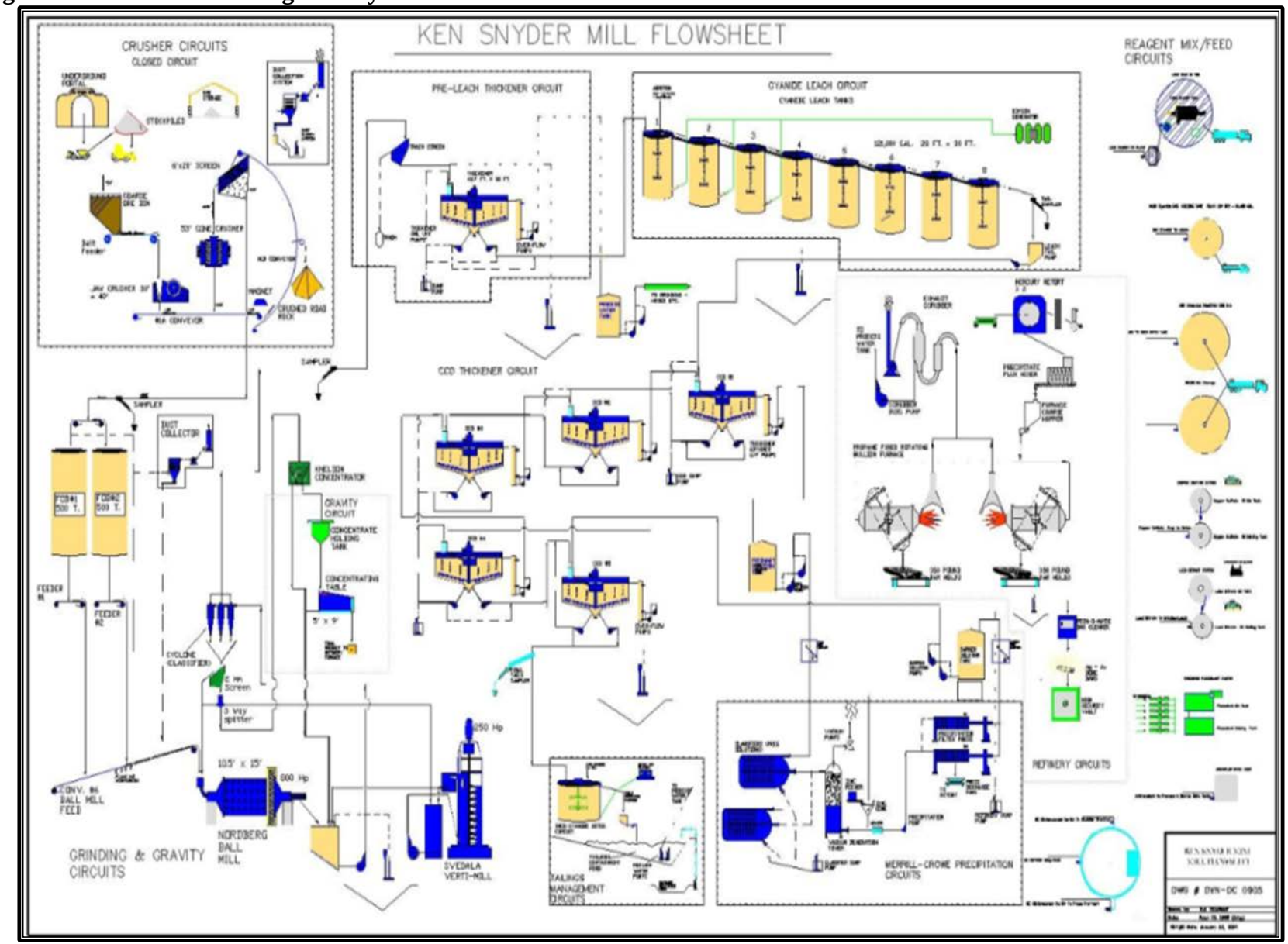
The leach circuit discharge is pumped to five 42.5-foot diameter CCD thickeners, where the pulp is counter-current washed with barren Merrill Crowe liquor at a wash ratio of approximately 2.5:1, and CCD thickener underflow at each stage is maintained at 50-56% solids to maximize wash efficiency.

Pregnant CCD solution at a pH of 11.0 and 400 gallons per minute flow rate is fed to one of two disc filters operating utilizing diatomaceous earth for clarification. The clarified pregnant solution is then pumped to a packed bed vacuum de-aeration tower, prior to the addition of zinc dust and lead nitrate to precipitate precious metals from solution. The Merrill Crowe precipitate solution is then pumped to one of two plate and frame filter presses for sludge recovery ahead of smelting on site to produce eight-inch by 30–inch, 350 pound silver/gold doré bars.

Tailings pulp from the last CCD thickener is pumped to the INCO (INCO Services, Inc.) SO2-air circuit for cyanide destruction. Cyanide destruction is performed in a single 20-foot by 20-foot agitated, air sparged tank providing approximately one hour reaction time. Ammonium bi-sulphite and copper sulphate catalyst are added to the tank on the basis of ratio control to achieve target Weak Acid Dissociable (WAD) cyanide levels below five-ppm. Routine picric acid titrations, coupled with colorimetric determinations, are used by operating personnel to maintain WAD cyanide in the INCO cyanide destruction tank discharge pulp at target levels.

Following cyanide destruction, the plant tailings pulp is discharged to one of two lined tailings storage facilities for consolidation and water recovery. Clarified decant pond solution is evaporated or returned to the mill process water tank for reuse in the plant.

Figure 16-1 Midas Processing Facility Flow Sheet



16.2 Precious Metal Recovery for Midas and Fire Creek Mineralized Material

The Midas Mill performance from January 1, 2013 through July 31, 2013 was used in determining metal recovery for Midas ore. The dates used represent a period when only Midas ore was processed in the mill. A multiple linear regression analysis was completed for both gold and silver recovery looking at mill throughput rate and head grade. The results of the regression analysis are given below:

Gold recovery % = 100 x (0.90113 - 9.2 x 10 -6 x daily mill throughput + 0.1775 x gold head grade)

Silver recovery% = 100 x (0.91682 - 1.8 x 10 -5 x daily mill throughput + 0.00664 x silver head grade)

These equations were used to generate Table 16-1 to estimate gold and silver recoveries for Midas mineralization. (Amec 2013)

Table 16-1 Estimated Precious Metal Recovery of Midas Ore

Daily Mill Throughput (tons)	Gold Head Grade (opt)	Gold Recovery	Silver Head Grade (opt)	Silver Recovery
400	0.1	91.5%	4	93.6%
600	0.1	91.3%	4	93.3%
800	0.1	91.2%	4	92.9%
400	0.2	93.3%	6	94.9%
600	0.2	93.1%	6	94.6%
800	0.2	92.9%	6	94.2%
400	0.3	95.1%	8	96.3%
600	0.3	94.9%	8	95.9%
800	0.3	94.7%	8	95.6%

Klondex began operating the Midas Mill on February 19, 2014 and immediately began processing a blend of Midas mineralized material and mineralized material from the Fire Creek bulk sampling program at a rate of 23-25 tph. A production decision at Fire Creek has not been made by Klondex, as it is still in the bulk sampling phase. At the end of the first quarter of 2014, a total of 21,727 tons of material (36% Fire Creek and 64% Midas) had been processed at an average feed grade of 0.54 opt Au and 7.73 opt Ag. Gold and silver recoveries were averaged at 96.3% and 95.8%, respectively, for the period.



17 Project Infrastructure

17.1 Road Access

The Project is easily accessible from paved state highways to the mine access road, from a graded gravel road. The mine access passes through a residential area for about two miles, which reduces the speed limit in this area to minimize any potential impacts on the community. Access to Fire Creek is from dirt roads that can be impeded by mud in wet or snowy weather.

The state and county roads are well maintained in order to service the ranches and mines in Crescent Valley. Klondex provides some road maintenance assistance to Lander County.

17.2 Power and Electrical Infrastructure

A regional electrical transmission line runs two miles east of Fire Creek. A substation was constructed in 2012. The power line joining Fire Creek to the substation was completed in August 2013. Fire Creek is no longer using generators to supply power.

17.3 Water Management and Water Treatment

Klondex manages surface and underground water using a pond system, drainage ditches, and a water treatment plant (WTP). Surface water from precipitation events is diverted away from Fire Creek infrastructure with a series of drainage ditches. Surface water within the disturbance areas is diverted to one of two ponds, which make up Fire Creek's water management system, the Storm Water Pond and the Dewatering Pond. The ponds have a combined volume of approximately 4.7 million gallons (Figure 17-1). Klondex is currently permitting and constructing two Rapid Infiltration Basins (RIBs), which will also be included in the water management system.

Water from underground exploration operations that does not meet Nevada Division of Environmental Protection's (NDEP) Profile I standards (Profile I) is pumped to the Dewatering Pond, approximately 2.8 million gallons total capacity. This water is treated through the WTP to meet the Profile I requirement. Brine reject solution from the WTP is stored in the Storm Water Pond, where it is evaporated or shipped off-site for disposal. Treated water from the WTP and water from the underground that meets the Profile I standard can be managed in several ways: used for dust suppression on roads and during construction events; infiltrated in the RIBs; or used underground for mining activities.

Klondex has permitted and constructed an artesian well, PW-1, which can provide up to three gallons per minute (gpm) of fresh water to Fire Creek. Klondex currently holds annual water

rights for 283 acre-feet of water. Fire water is located above the facilities and gravity flows to hydrants located near the Project buildings.

Permit applications have been submitted to NDEP for construction and operation of a RIB to dispose of water from dewatering operations. When completed, the RIBs are expected to have the capacity to infiltrate up to 3,000 gpm of water meeting the Profile I standard. Permit approval was obtained in June 2014.

Figure 17-1 Fire Creek Project Facilities



17.4 Site Infrastructure

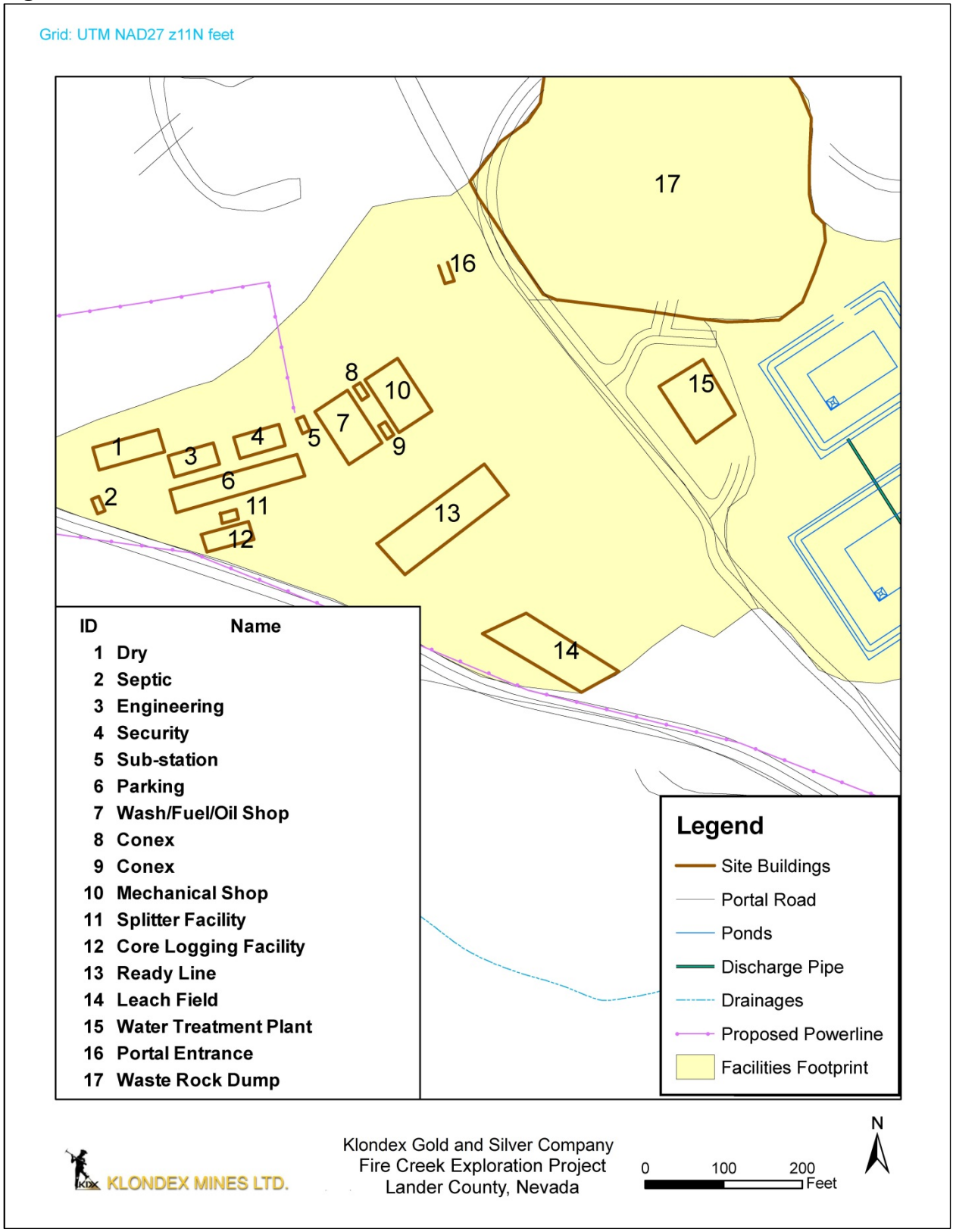
Fire Creek infrastructure comprises two large tented structures, heavy equipment parking areas, three mobile trailers, several Conex mobile containers, and lay-down areas. The two-tented structures are used for maintenance of the mobile fleet and other production related equipment. The east bay is designated the mechanical shop. The west bay is divided into an area for lubrication and a wash bay. Several Conex containers and outbuildings are used for storing parts

and tools near the maintenance buildings. The electric storage area and diesel storage area are also located near the maintenance building (Figure 17-2).

The engineering office, security, and staff dry area are in three mobile trailers with light vehicle parking areas in front. These buildings are connected to non-potable water pipelines and septic system. The core logging facility is a 1,000 square foot (sf) plasticized-canvas covered outbuilding with overhead lights and propane heater located beside a core lay down area of about 500 sf. The core splitting facility is housed next to the core logging facility in a mobile Conex container.

In addition to the offices, there are areas designated for septic leach field, waste rock dump, WTP, sediment control ditches, and re-vegetated stockpiles.

Figure 17-2 Site facilities

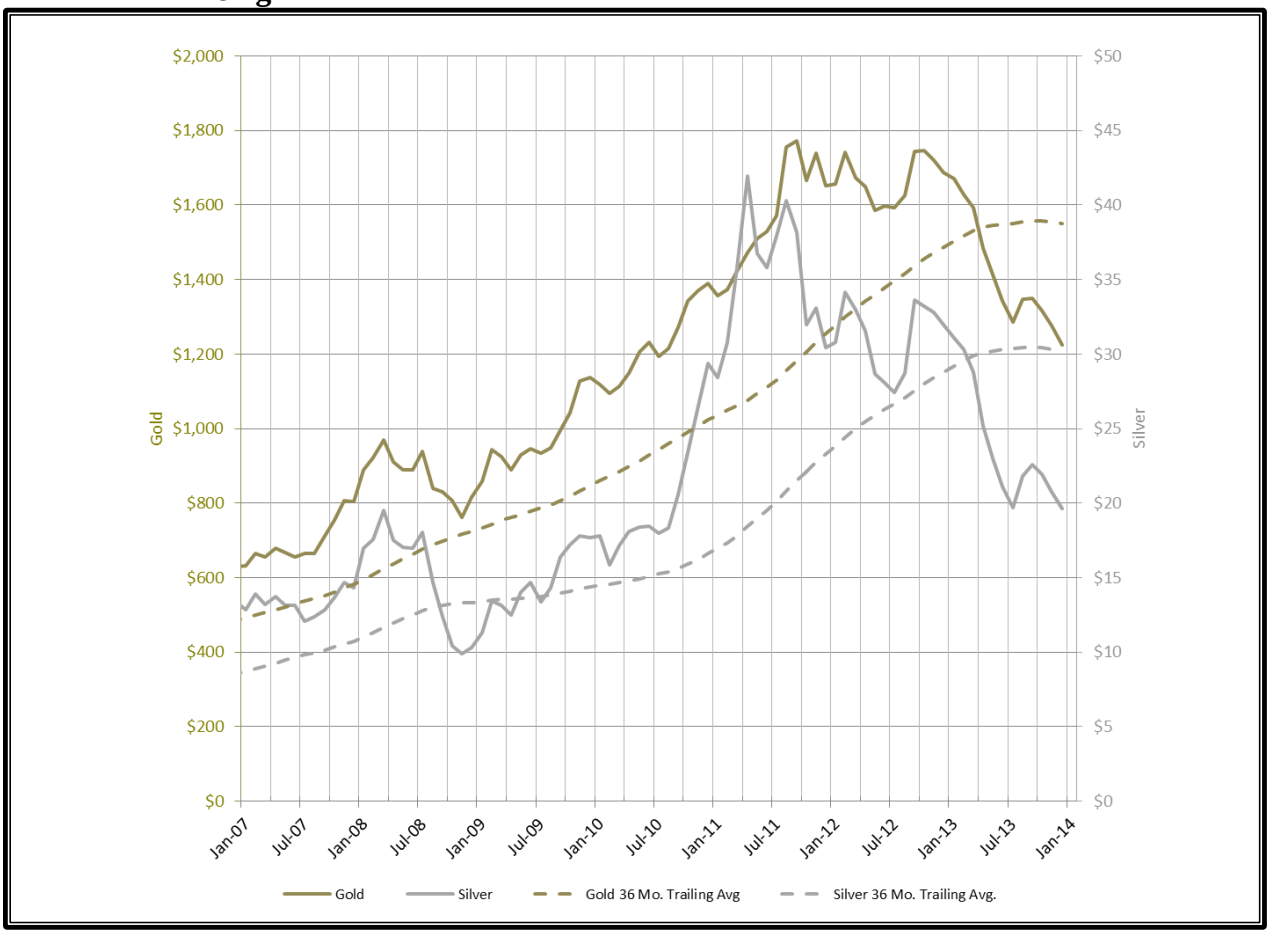


18 Market Studies and Contracts

18.1 Precious Metal Markets

Gold and silver markets are mature with reputable smelters and refiners located throughout the world. Following several years of increases, gold and silver prices began declining in 2012. At the end of 2013, the 36-month trailing average gold price was $1,549 per ounce, the 24-month trailing average price was $1,540 while the monthly average had dropped to $1,225. The silver price trend shows similar behaviour and both are shown in Figure 18-1.

Figure 18-1 Historic Gold and Silver Monthly Average and 36 Month Trailing Average Pricing



18.2 Contracts

Fire Creek presently has several working contracts in force at the present time with suppliers and contractors. Major contracts include American Drilling Corp. for underground core drilling, American Mining & Tunneling for mine development services, and John Davis Trucking for ore

transportation from Fire Creek to the Midas Mill. The QP has reviewed these contracts and found the terms to be within normal industry practices.

18.3 Project Financing

On February 11, 2014, the Company entered into the Gold Purchase Agreement with Franco-Nevada GLW Holdings Corp., a subsidiary of FNC, pursuant to which the Company raised proceeds of US$33,763,640 in consideration for the delivery of an aggregate of 38,250 ounces of gold on a monthly basis over a five-year period ending on December 31, 2018. Under the terms of the Gold Purchase Agreement, the Company is required to make gold deliveries at the end of each month, with the first delivery due on June 30, 2014. Gold deliveries will cease when the delivery of 38,250 ounces of gold is completed on December 31, 2018. The annualized delivery schedule is shown in Table 18-1.

Table 18-1 FNC Gold Delivery Schedule

Year	Gold Ounces
2014	6,750
2015	7,500
2016	8,000
2017	8,000
2018	8,000
Total	38,250

The Company's obligations under each of the Gold Purchase Arrangement and the Company's conncurrent debt financing (the "2014 Debt Financing") are secured against all of the assets and property of the Company and its subsidiaries. The security granted for the performance of the Company's obligations under the 2014 Debt Financing and the Gold Purchase Arrangement rank pari-passu.

On February 12, 2014, the Company entered into a royalty agreement (the FC Royalty Agreement) with Franco-Nevada US, a subsidiary of FNC, and KGS, pursuant to which KGS raised proceeds of US$1,018,050 from the grant to Franco-Nevada US of a 2.5% NSR royalty for Fire Creek.

19 Environmental Studies, Permitting, and Social or Community Impact

Klondex conducts mineral exploration activities in compliance with all applicable environmental protection legislation. Klondex is unaware of any existing environmental issues or compliance problems that have the potential to impede production at Fire Creek. Klondex is working closely with both state and federal regulators to ensure that the permitting and compliance strategies are acceptable and will not cause delays in production or mine development. Klondex has a strong cultural resource preservation program, which allows a third party archeologist time to review potential areas of new disturbance. At this time, there are no community or social impact issues regarding work being completed at Fire Creek.

19.1 Environmental Compliance and Monitoring

As required by the environmental operational permits (see Table 19-1), Klondex prepares quarterly and annual reports to be submitted to regulators. Compliance information included in these reports is based primarily on permit requirements and limitations. Permit limits and associated monitoring requirements are specified as a part of the permit.

19.1.1 **Waste Rock Disposal Facility**

Initial humidity cell test work results indicate that a portion of the waste rock removed from the mine will have the potential to degrade waters of the State of Nevada. As a result of mine expansion, Klondex is relocating the waste rock disposal facility, and the new facility design will include waste rock staging to ensure that any material that has potential to degrade water of the state is segregated from non-acid generating materials and engineered to alleviate any acid drainage problem.

19.1.2 **Other Environmental Issues**

At this time, Klondex does not anticipate construction or operation of any processing facilities. Heap leaching, tailings management, or other processing components are not included as part of the permitting strategy and not part of the resource.

19.2 Reclamation Bond Estimate

Klondex's last amendment to the Reclamation Bond Estimate (RCE) to include construction and operation of the RIBs was received in February 2014. The total of the RCE is calculated using the Standard Reclamation Cost Estimator, which is adjusted annually for inflation. The SRCE was developed in a cooperative effort between the NDEP, Bureau of Mining Regulation and Reclamation, BLM and the Nevada Mining Association to facilitate accuracy, completeness and

consistency in the calculation of costs for mine site reclamation. Klondex is required to update the total RCE for Fire Creek every three years. The next RCE update is scheduled for 2016.

RCE costs for reclamation currently include the following categories: roads; exploration roads and drill pads; waste rock repository; RIBs; ponds; electrical infrastructure; building and equipment; adit and vent raise plugging; re-vegetation; and contractor management. The total RCE was approved by BLM and NDEP in the first quarter of 2014 for a total cost to construct of approximately $1.6 million dollars.

Klondex also maintains a second statewide bond for archeological conservation. This bond totaling $119,284, was implemented to facilitate a treatment plan as required by Nevada State Historic Preservation Office (SHPO) pursuant to 36CFR 800, regulations implementing Section 106 of the National Historic Preservation ACT (NHPA), 16 U.S.C. § 470f. The treatment plan will include, but not be limited to, mitigation of archaeological sites, artifact processing, writing final report of findings, and curation of artifacts.

19.3 Major Permitting and Approvals

The major operational permits and a brief summary of the requirement for each permit are outlined in Table 19-1 below.

Table 19-1 Fire Creek Project Significant Permits

Permit	Permit Number	Agency	Permit Type and Explanation
Environmental Assessment and Plan of Operations	NVN-079769	BLM	Plan of Operations is required for all mining and processing activities and exploration exceeding 5 acres of disturbance. BLM approves plan and determines the required environmental studies, usually an environmental assessment or an environmental impact study based on the requirements outline in the National Environmental Policy Act.
Record of Decision		BLM	A Record of Decision (ROD) in the United States is the formal decision document which is recorded for the public.
Water Pollution Control Permit (Operations)	NEV2007104	NDEP, BMRR	Mines operating in the State of Nevada are generally required to meet a zero discharge performance standard. A WPCP is required for the extraction of mineralized material. A separate permit may be issued for certain activities at a specific facility, such as rapid infiltration.
Water Pollution Control Permit (Infiltration)	NEV2013102	NDEP, BMRR	Water Pollution Control Permit for infiltration of water from the underground mine operations. This permit is still in the approval process.
Water Rights	28637, 77002, 77003, 75129	NDWR	Water rights are issued by the Nevada Division of Water Resources based on Nevada water law which issues permits based on prior appropriation and beneficial use. Prior appropriation (also known as "first in time, first in right") allows for the orderly use of the state's water resources by granting priority to parties with senior water rights. This concept ensures the senior uses are protected, even as new uses for water are allocated.
Reclamation Permit	#0241	NDEP, BMRR	Summarizes reclamation activities and associated costs. Ensures land disturbed by mining activities are reclaimed to safe and stable conditions to promote and safe and stable post-mining land use. A permit is required for any disturbance over 5 acres. The RCE is financially secured with a posted security. The posted surety amount provides assurance that reclamation will be pursuant to the approved reclamation plan.
Air Quality Permit	AP1041-2774	NDEP, BAPC	An owner or operator of any proposed stationary source must submit an application for and obtain an appropriate operating permit before commencing construction or operation. Class II Air Permit - Typically for facilities that emit less than 100 tons per year for any one regulated pollutant and emit less than 25 tons per year total HAP and emit less than 10 tons per year of any one HAP.
Storm Water Permit	NVR300000	NDEP, BWPC	General storm water discharges associated with activities from metal mining activities. Regulates storm water runoff from waste rock storage piles, roads, and cleared areas. Typical pollutants include suspended solids and minerals eroded from exposed surfaces.



19.4 Future Permitting

Klondex has an approved plan of operations with the BLM covering their current exploration activities at the site. Klondex is currently waiting for approval to an amendment to the Plan of Operations and Reclamation permits (NVN-07976 and reclamation permit 0028). This amendment will allow Klondex to construct and operate several rapid infiltration basins ("RIBs"). Klondex received approval for the Water Pollution Control Permit for the RIBs (WPCP2013102), issued in February 2014. Klondex has initiated a baseline data collection program to ensure that enough data is collected to be sufficient for additional permitting necessities.

20 Capital and Operating Costs

20.1 Capital Costs

LOM constant dollar capital expenditures are detailed in Table 20-1. Mine development comprises over 57% of total capital requirements, resource conversion drilling comprises 23% and site facilities comprise 6%. Typical mine development unit costs, for similarly sized excavations in northeastern Nevada, are shown in Table 20-2.

Table 20-1 Capital Costs

	Cost (000's)				
	2014	2015	2016	2017	Total
Mine Development	$6,700	$6,773	$9,411	$5,481	$28,365
Rapid Infiltration Basin	$736				$736
Site Facilites	$1,603	$1,127			$2,730
Environmental Assesment	$937				$937
Mining Equipment	$400	$2,200	$2,000	$932	$0
Underground and Surface Drilling	$2,300	$3,000	$3,000	$3,000	$11,300
Total	$12,676	$13,100	$14,411	$9,413	$49,600

Table 20-2 Underground Development Unit Costs

Description	Width (ft)	Height (ft)	Unit Cost ($/ft)
Primary Capital Drifting	14	14	$1,200
Secondary Capital Drifting	14	14	$1,000
Raising	10	10	$2,000

20.2 Operating Costs and Cutoff Grade

LOM operating costs are presented in Table 20-3 below. Unit mining costs are based on rates from mines similar to what is contemplated for Fire Creek and Klondex engineering estimates. The weighted average cost is based on the LOM quantities in each category. Haulage costs to Midas are based on actual costs incurred by the Company and paid to a local contractor in 2013 and 2014 to date.

Table 20-3 Operating Costs

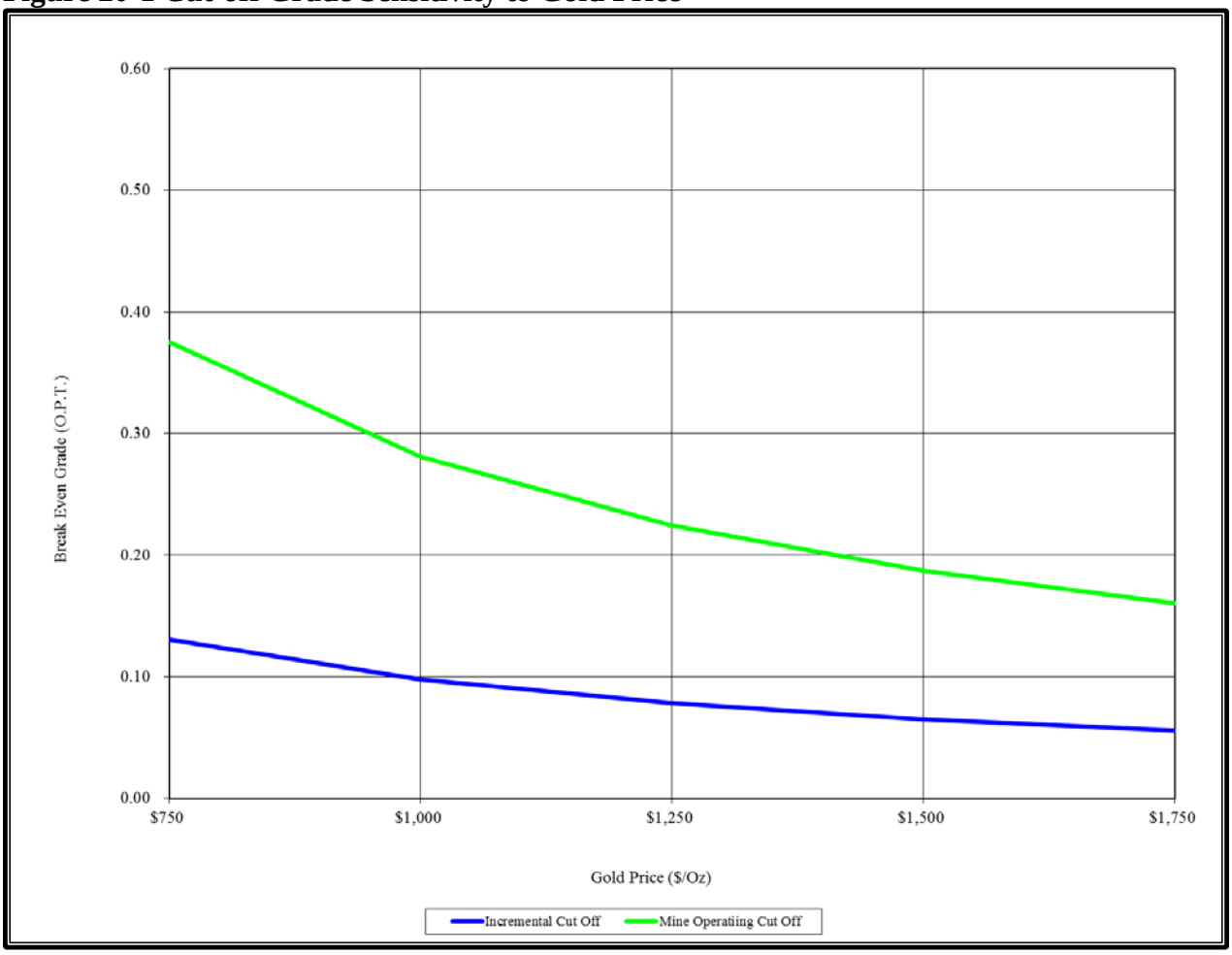
Mining		
Production Stoping	$135.00	/ton
5 x 11 Stope Development Drift	$160.00	/ton
Backfill	$25.00	/ton
Average Mining Cost	$169.74	/ton
Transportation, Processing and G&A		
Haulage Fire Creek to Midas	$36.75	/ton
Processing	$40.00	/ton
Site Administration and G&A	$13.67	/ton
Total	$260.16	/ton

Using the operating costs and parameters above, cut-off grades were calculated at varying gold prices. These are shown in Table 20-4 and Figure 20-1. The mine operating or "all in" cut-off represents the minimum grade an excavation must return in order to be profitable. The incremental cut-off represents the required minimum grade of mineralization to be profitable to process after it has been mined and transported to the surface. Mineralization from development excavations is included in the LOM plan if it exceeds the incremental cut off since processing the incremental material improves the projects cash flow over the alternative of sending this material to the waste dump.

Table 20-4 Cut-off Grade Calculation

Gold Price	$/oz	$750	$1,000	**$1,250**	$1,500	$1,750
Refining and Sales	$/oz			$5.00		
Royalty				1%		
Metallurgical Recovery				94%		
Transportation Processing and G&A	$/ton			$90.42		
Incremental Cut-off	opt	0.130	0.098	0.078	0.065	0.056
Direct Mining Cost	$/ton			$169.74		
Mine Operating Cut-off	opt	0.375	0.281	**0.225**	0.187	0.160

Figure 20-1 Cut-off Grade Sensitivity to Gold Price



21 Economic Analysis

The LOM plan and technical and economic projections in the LoM plan model include forward looking statements that are not historical facts and are required in accordance with the reporting requirements of the Canadian Securities Administrators. These forward-looking statements are estimates and involve risks and uncertainties that could cause actual results to differ materially.

This preliminary economic assessment is preliminary in nature, and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the preliminary economic assessment will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

21.1 Life of Mine Plan and Economics

Constant dollar cash flow analysis of the LoM production and development plan shown in Table 21-1 is presented in the income and cash flow statements in Table 21-2 and Table 21-3, respectively. Table 21-4 lists the life of mine key operating and financial indicators. The grade of the Fire Creek resources and the low capital requirements facilitated with the addition of the Midas Mine and Mill to Klondex's project portfolio combine to produce a short 0.5-year capital payback period and an impressive 4.1 profitability index (PI) calculated with a 5% discount rate. PI is the ratio of payoff to investment of a proposed project. It is a useful tool for ranking projects because it allows you to quantify the amount of value created per unit of investment. A profitability index of 1 indicates break even. Calculation of an internal rate of return (IRR) is indeterminate due to the positive cash flow projected to be achieved in each year of the project.

Royalties incurred during the life of mine plan include the advance minimum royalty payments to third party lessors and the 1% royalty to Waterton under the Gold Supply Agreement as discussed in Section 4.3. The LoM plan ends prior to the 2 ½% royalty taking effect as specified in the FC Royalty Agreement with Franco-Nevada US. None of the LoM production is from holdings subject to NSR royalties nor will it transit through holdings subject to wheelage royalties.

Table 21-1 Fire Creek Project Production and Development Plan

Mineral Resource Category		2014	2015	2016	2017	2018	Total
Measured	kt	9.2	7.0	1.6	4.5	9.6	32.0
Gold Grade	opt	1.28	0.73	1.20	1.88	1.35	1.26
Silver Grade	opt	0.89	0.44	0.60	1.24	0.94	0.84
Contained Gold	koz	11.8	5.1	1.9	8.5	13.0	40.4
Contained Silver	koz	8.2	3.1	1.0	5.6	9.0	26.9
Indicated	kt	34.3	65.5	62.3	32.8	16.2	211.1
Gold Grade	opt	0.70	0.69	0.73	0.64	0.56	0.69
Silver Grade	opt	0.44	0.42	0.40	0.30	0.34	0.39
Contained Gold	koz	24.1	45.5	45.5	20.8	9.0	144.9
Contained Silver	koz	15.0	27.6	25.2	9.7	5.5	83.0
Measured + Indicated	kt	43.5	72.5	63.9	37.3	25.8	243.1
Gold Grade	opt	0.82	0.70	0.74	0.79	0.85	0.76
Silver Grade	opt	0.53	0.42	0.41	0.41	0.56	0.45
Contained Gold	koz	35.9	50.6	47.4	29.4	22.0	185.3
Contained Silver	koz	23.2	30.7	26.1	15.4	14.6	109.9
Inferred	kt	16.8	20.6	64.7	89.5	4.3	195.8
Gold Grade	opt	0.56	0.69	0.50	0.57	1.32	0.57
Silver Grade	opt	0.36	0.45	0.14	0.15	0.68	0.21
Contained Gold	koz	9.4	14.1	32.3	50.6	5.6	112.0
Contained Silver	koz	6.0	9.3	9.1	13.6	2.9	40.8
Expensed Waste	kt	3.2	4.6	3.7	8.2		19.8
Capital Development	ft	4,149	5,617	7,645	4,567		21,978

Table 21-2 Income Statement 2014 – 2018 ($000's)

	2014	2015	2016	2017	2018	Total
Gold Sales	$53,187	$76,000	$93,728	$93,924	$32,499	$349,338
Silver Sales	$484	$661	$583	$480	$289	$2,497
Operating Costs	($15,764)	($24,198)	($33,048)	($32,675)	($8,500)	($114,185)
G & A Costs	($2,645)	($3,644)	($4,282)	($4,284)	($1,595)	($16,451)
EBITDA	$35,263	$48,819	$56,980	$57,445	$22,693	$221,199
Reclamation Accrual (UOP)	($244)	($348)	($429)	($430)	($149)	($1,600)
Depreciation	($16,481)	($26,912)	($39,325)	($46,401)	($16,055)	($145,175)
Pre-tax Income	$18,538	$21,559	$17,225	$10,614	$6,489	$74,424
Income Tax	($1,595)	($4,111)	($3,421)	($2,296)	($1,284)	($12,706)
Net Income	$16,943	$17,448	$13,805	$8,318	$5,205	$61,718

Table 21-3 Cash Flow Statement 2014 – 2019 ($000's)

	2014	2015	2016	2017	2018	2019	Total
Net Income	$16,943	$17,448	$13,805	$8,318	$5,205	$0	$61,718
Depreciation	$16,481	$26,912	$39,325	$46,401	$16,055	$0	$145,175
Reclamation	($1,356)	$348	$429	$430	$149	$0	($0)
Working Capial	($2,124)	($1,088)	($1,095)	$43	$3,100	$1,165	$0
Operating Cash Flow	$29,944	$43,620	$52,464	$55,191	$24,509	$1,165	$206,893
Capital	($12,676)	($13,100)	($14,411)	($9,413)	$0	$0	($49,600)
Net Cash Flow	$17,268	$30,520	$38,054	$45,778	$24,509	$1,165	$157,293

Table 21-4 Key Operating and Financial Statistics

Description	Value
Material Mined and Processed (kt)	439
Avg. Gold Grade (OPT)	0.68
Avg. Silver Grade (OPT)	0.34
Contained Gold (koz)	297
Contained Silver (koz)	151
Gold Metallurgical Recovery	94%
Silver Metallurgical Recovery	92%
Recovered Gold (koz)	280
Recovered Silver (koz)	139
Mine Life (years)	5
Cash Cost ($/oz) [1]	$459
Total Cost ($/oz) [1]	$636
Gold Price ($/oz)	$1,250
Silver Price ($/oz)	$18
LoM Capital Cost ($ Millions)	($49.6)
Payback Period (years)	0.5
After Tax Indicators	
Cash Flow ($ Millions)	$157.3
5% Discounted Cash Flow ($ Millions)	$141.5
10% Discounted Cash Flow ($ Millions)	$128.3
Profitability Index @ 5% Discounting	4.1
Profitability Index @ 10% Discounting	3.9
Depreciation Basis Dec. 31, 2013 ($ Millions)	($95.5)
Pre-Tax Indicators	
5% Discounted Cash Flow ($ Millions)	$153.1
10% Discounted Cash Flow ($ Millions)	$139.1

Notes:

1. *Net of silver by-product credit.*

21.2 Sensitivity Analysis

The project's 10% net present value (NPV) and profitability index from the cash flow model presented above were analysed for sensitivity to variations in revenue, operating and capital cost assumptions. This analysis is presented graphically in Figure 21-1 through Figure 21-3 below. These graphs demonstrate the economic resilience of Fire Creek by maintaining profitability with up to 40% unfavorable variances of any one of the three categories.

Figure 21-1 5% NPV Sensitivity

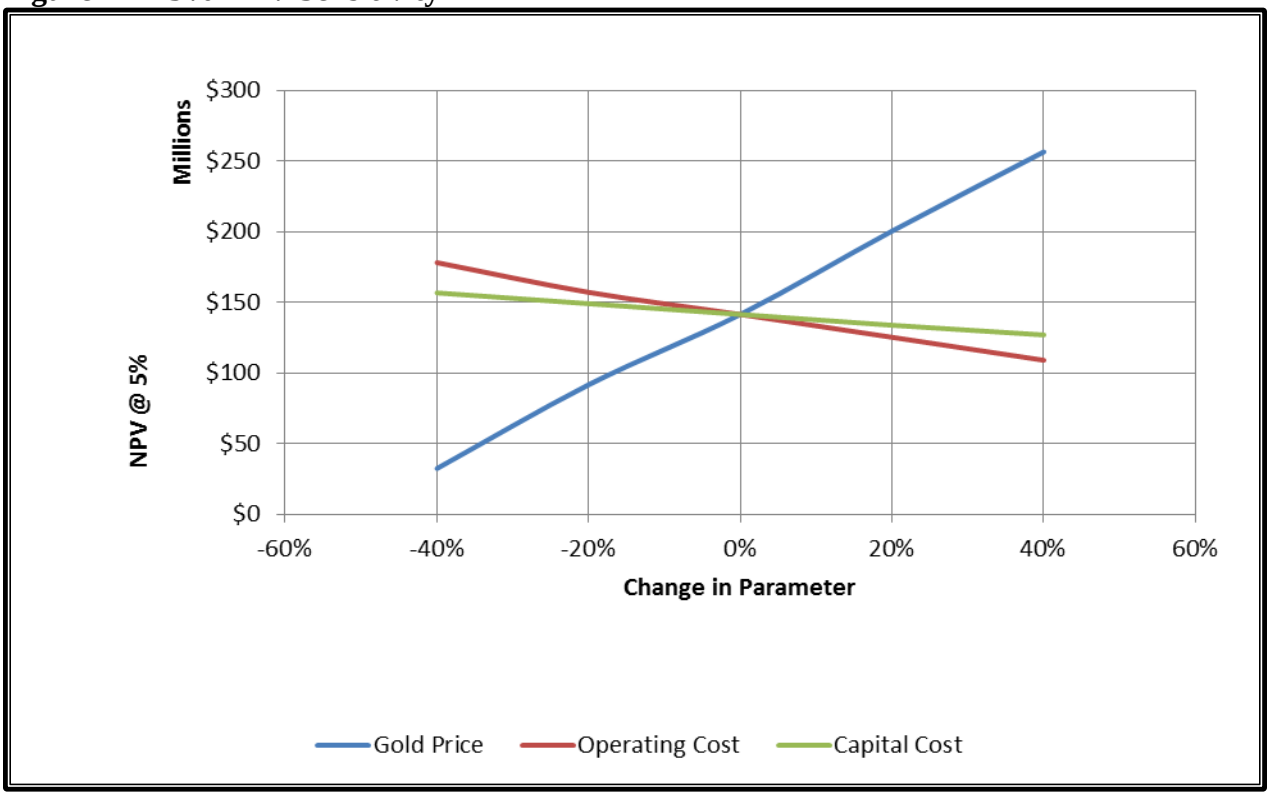


Figure 21-2 10% NPV Sensitivity

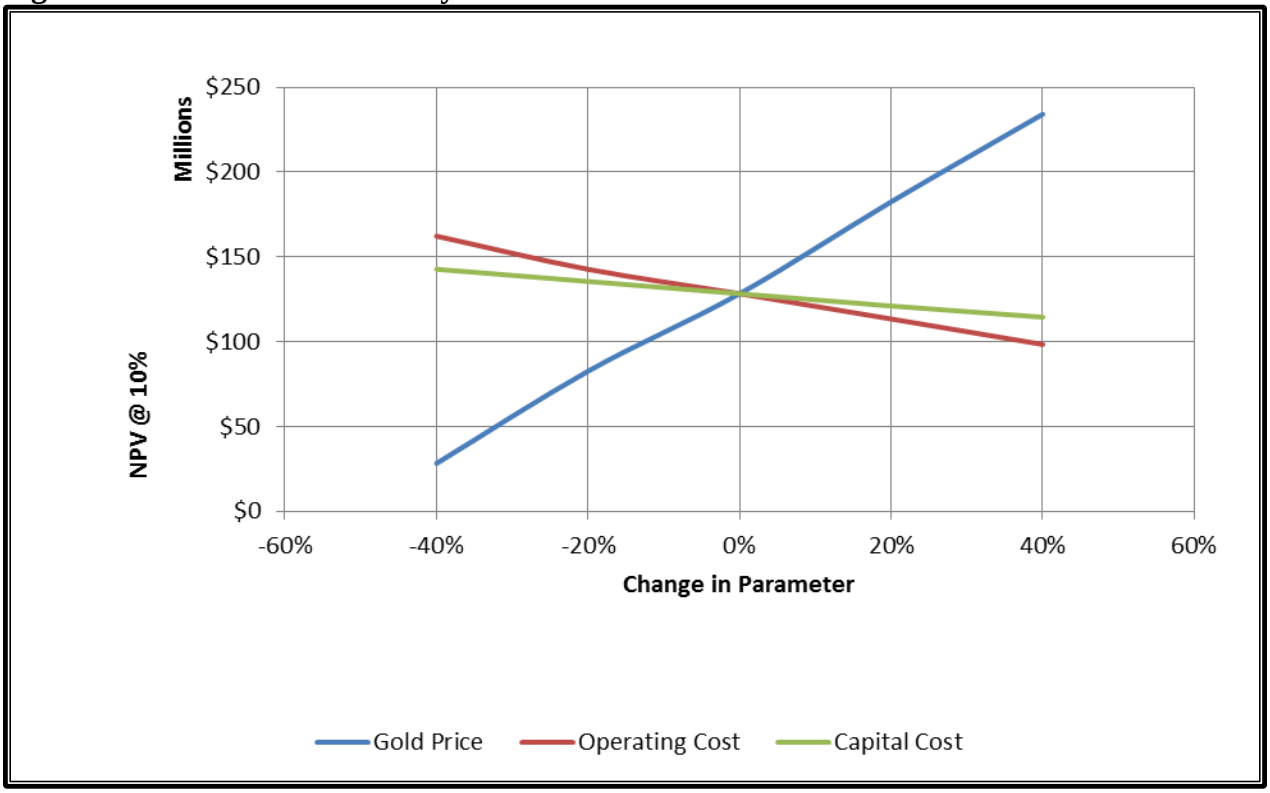
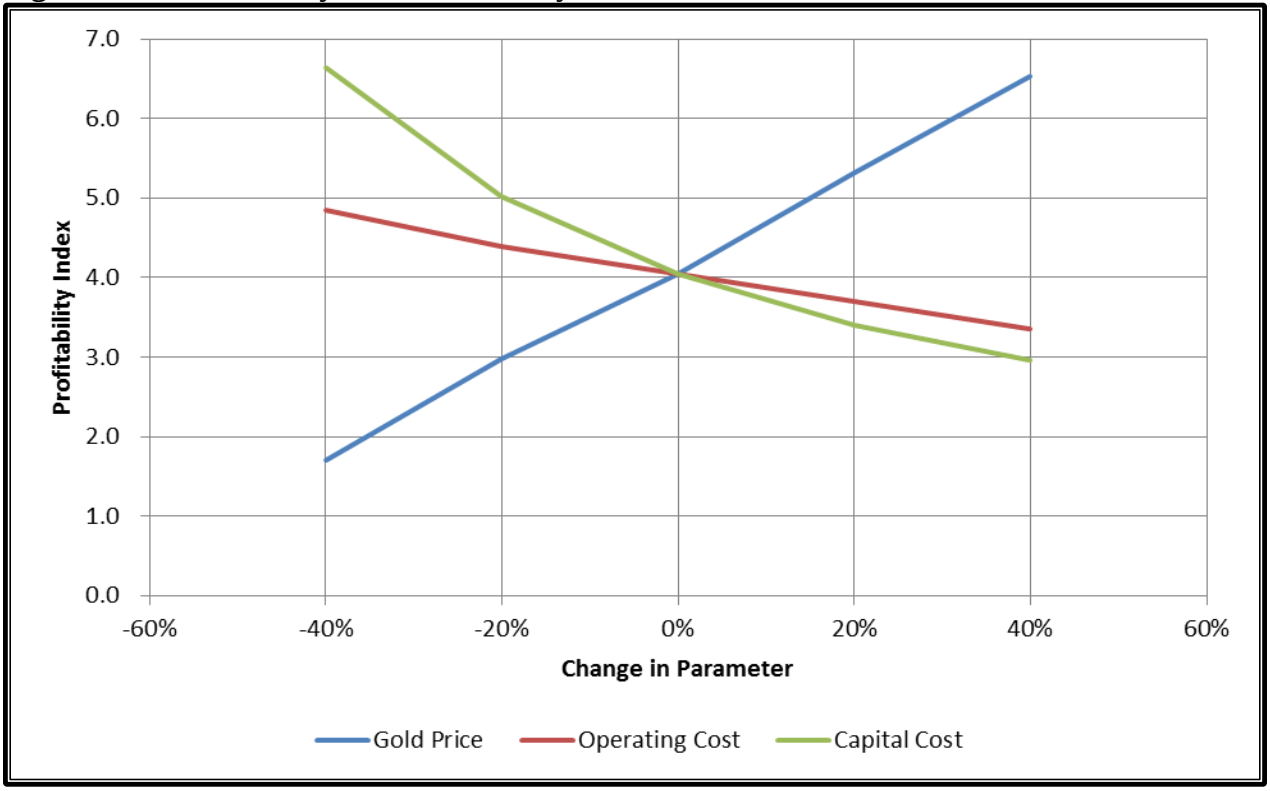


Figure 21-3 Profitability Index Sensitivity



22 Other Relevant Data and Information

The authors are not aware of any other relevant data and information having bearing on the Fire Creek mineral resource or ongoing exploration and mining operations.



23 Interpretations and Conclusions

Klondex has identified several high grade epithermal vein arrays at Fire Creek. Significant progress has been made in the past 24 months in terms of underground exploration and development, which has greatly enhanced the Company's knowledge and understanding of the geology and style of mineralization. The full extent and quality of these vein arrays will be determined by continuing the current drilling programs, surface and underground, test mining and underground mine development.

The high mineralization average grade of 0.68 opt gold allows the Project to maintain positive economics with up to 40% negative variations in any one of gold price, operating costs or capital expenditures. Alternative mining methods such as shrinkage stoping or cut and fill stoping may reduce the total cost per ounce of gold produced by limiting dilution, both planned and unplanned, or by reducing the capital development requirements.

23.1 Project Risks

Table 23-1 presents the significant risks identified by the authors that have the potential to negatively impact Fire Creek. The probability of any of these risks of occurring has not been determined, nor has the extent of any impact on the development of the Project.

Table 23-1 Potential Fire Creek Project Risks

Risk	Potential Impact	Mitigating Measures	Opportunities
Mineral resource grade thickness less than minimum	Subject portion of mineral resource cannot be converted to mineral reserves	Consider selective, higher cost, mining methods	Wall dilution may contain "Halo" low grade mineralization
Permitting delays	Delayed production	Necessary permits have been received or the applications have been submitted	
Gold price less than forecast	Lower revenues	Raise cutoff grade or reduce underground development to low grade zones	Fire Creek cash flow remains positive with up to a 40% reduction in gold price
High level of dilution due to vein irregularities	Increased operating costs or mineral resource cannot be converted to mineral reserve	Consider selective, higher cost, mining methods	
Metallurgical recovery less than forecast	Lower revenues	Increase cutoff grade, optimize plant operating parameters	Forecast recovery of 94% may be low in light recent plant performance data



24 Recommendations

24.1 Exploration

Underground drilling should continue in the veins identified near the current development workings to increase the level of confidence in these veins to an indicated classification. The decline should be advanced to provide an underground drill platform from which to drill the veins in the North and Far North Zones. While the decline is being advanced, additional drilling in this area can be completed from surface to refine the vein targets.

Rib sampling along the drifts on the Joyce Vein and Vonnie Vein is limited and should be supplemented by drilling shallow ten to 20-foot deep holes into the rib with hand held drills and sampling the drill cuttings. This sampling method will add a third dimension to the potential wall rock mineralization.

24.2 Test Mining and Development

Exploration and underground development work completed to date has identified and confirmed the continuity of several hundred feet of strike length on the Joyce Vein and Vonnie Vein. The position of the decline relative to these veins permits an ideal access at an elevation 40 feet above the current level of mining. Development of the crosscut and stope development drifts should begin as soon as possible. Once this second level has been developed, test stoping of the Joyce and Vonnie Veins should be undertaken to provide a better understanding of the following:

- Minimum attainable mining widths;
- Stope wall geotechnical conditions and impact on unplanned dilution; and
- Vertical vein geometry and continuity.

24.3 Other Recommendations

In order to support ongoing underground development and exploration work, the mine infrastructure improvements to the ventilation and secondary egress need to be completed. Additionally, the RIBs should be constructed to enhance the water management and disposal capabilities.

Core logging, mapping, and sampling have identified mineralization in the wall rock immediately adjacent to some of the quartz/calcite veins. This material should be modeled for inclusion as an additional mineral resource.

The database of silver assays is not complete. Where deficiencies in the core are identified, the sample rejects should be located and resubmitted for silver assaying to allow the inclusion of silver values in the next mineral resource estimate.

QAQC: The blanks, FCOXBLNK01 and FCRDBLNK01, display erratic results, which might indicate contamination within the sample runs and reporting results at the detection limits of the assaying method. The sampling protocol submitted to ALS should include the directive to run and flag the immediate and subsequent sample sets for re-assaying when the blank assay variance exceeds the acceptable limit.

Analysis of the standards submitted to ALS indicates a trend to under-report the gold mineralization values in the higher grade standards. This should be followed up with a cross checking program conducted at an independent laboratory.

QAQC protocols for silver similar to those in place for gold should be implemented.

A metallurgical testing program to determine optimum processing methods, recoveries and reagent consumptions should be developed. Samples for testing should be composited from similar styles of mineralization identified by core drilling and underground sampling. Additionally, the program should quantify the head grade versus recovery relationship.

DATA MANAGEMENT: Fire Creek has an unreliable internet connection. There is no Systems Administrator to plan or implement an enterprise system solution for VPN connection between the mine site and Elko office servers. An enterprise system would create a secure, user-password protected connection for immediate communication and for automated backups. At this time, data is transported on external hard drives between the mine site and the Elko offices due to unreliable internet access.

Table 24-1 Recommendation Estimated Costs Included in LOM Capital Spending

Description	Area	Estimated Costs
Development of the Fire Creek Exploration Project		
Rib Construction	All	$ 736,200
Ventilation raise and secondary egress	All	$ 225,000
Underground drilling	All	$ 9,250,000
Surface Exploration	North and Far North	$ 2,000,000
Sample drilling Joyce and Vonnie Vein ribs	South, Main, West and North	$ 50,000
Upgrade communications network	All	$ 65,000
Total Dedicated to Fire Creek Project		$ 12,326,200

25 References

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26 Glossary

Assay: The chemical analysis of mineral samples to determine the metal content.

Asbuilt: (plural asbuilts), a field survey, construction drawing, 3D model, or other descriptive representation of an engineered design for underground workings.

Composite: Combining more than one sample result to give an average result over a larger distance.

Concentrate: A metal-rich product resulting from a mineral enrichment process such as gravity concentration or flotation, in which most of the desired mineral has been separated from the waste material in the ore.

Crushing: Initial process of reducing material size to render it more amenable for further processing.

Cut-off Grade (CoG): The grade of mineralized rock, which determines as to whether or not it is economic to recover its gold content by further concentration.

Dilution: Waste, which is unavoidably mined with ore.

Dip: Angle of inclination of a geological feature/rock from the horizontal.

Fault: The surface of a fracture along which movement has occurred.

Footwall: The underlying side of an mineralized body or stope.

Gangue: Non-valuable components of the ore.

Grade: The measure of concentration of gold within mineralized rock.

Hanging wall: The overlying side of an mineralized body or slope.

Haulage: A horizontal underground excavation which is used to transport mined ore.

Igneous: Primary crystalline rock formed by the solidification of magma.

Kriging: An interpolation method of assigning values from samples to blocks that minimizes the estimation error.

Level: Horizontal tunnel the primary purpose is the transportation of personnel and materials.

Lithological: Geological description pertaining to different rock types.

Material Properties: Mineral properties.

Milling: A general term used to describe the process in which the ore is crushed and ground and subjected to physical or chemical treatment to extract the valuable metals to a concentrate or finished product.

Mineral/Mining Lease: A lease area for which mineral rights are held.

Mining Assets: The Material Properties and Significant Exploration Properties.

Sedimentary: Pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks.

Sill: A thin, tabular, horizontal to sub-horizontal body of igneous rock formed by the injection of magma into planar zones of weakness.

Stope: Underground void created by mining.

Stratigraphy:	The study of stratified rocks in terms of time and space.
Strike:	Direction of line formed by the intersection of strata surfaces with the horizontal plane, always perpendicular to the dip direction.
Sulfide:	A sulfur bearing mineral.
Tailings:	Finely ground waste rock from which valuable minerals or metals have been extracted.
Thickening:	The process of concentrating solid particles in suspension.
Total Expenditure:	All expenditures including those of an operating and capital nature.
Variogram:	A statistical representation of the characteristics (usually grade).

Mineral Resources

The mineral resources have been classified according to the "CIM Standards on Mineral Resources and Reserves: Definitions and Guidelines" (2010) which are recognized by NI 43-101. Accordingly, the mineral resources in this Technical Report have been classified as Measured, Indicated or Inferred.

A Mineral Resource is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated, or interpreted from specific geological evidence and knowledge.

An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

A ‘Measured Mineral Resource’ is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

27 Appendix A Certificate of Authors and Consent Forms

CERTIFICATE OF AUTHOR

Re: *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended,* dated the 24th day of July, 2014, with an effective date of January 31, 2014:

I, Mark A. Odell, P.E., do hereby certify that:

As of July 24, 2014, I am a consulting mining engineer at:
Practical Mining LLC
495 Idaho Street, Suite 205
Elko, Nevada 89801
775-345-3718

1) I am a Registered Professional Mining Engineer in the State of Nevada (# 13708), and a Registered Member (#2402150) of the Society for Mining, Metallurgy and Exploration (SME).

2) I am a graduate of The Colorado School of Mines, Golden, Colorado with a Bachelor of Science Degree in Mining Engineering in 1985. I have practiced my profession continuously since 1985.

3) Since 1985, I have held the positions of mine engineer, chief engineer, mine superintendent, technical services manager and mine manager at underground and surface metal and coal mines in the western United States. The past 9 years, I have worked as a self-employed mining consultant with clients located in North America, Asia and Africa. My responsibilities have included the preparation of detailed mine plans, geotechnical engineering, reserve and resource estimation, preparation of capital and operating budgets and the economic evaluation of mineral deposits.

4) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my experience and qualifications and good standing with proper designation within a recognized professional organization fully meet the criteria as a Qualified Person as defined under the terms of NI 43-101.

5) I am a contract consulting engineer for the issuer and Project owner: Klondex Mines Ltd. and have inspected the Fire Creek site on June 27, 1013, September 6, 2013 and November 25, 2013.

6) I am responsible for preparation of all sections of the technical report titled *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended,* all sections, dated the 24th day of July, 2014, with an effective date of January 31, 2014 (Technical Report).

7) I am independent of Klondex Mines Ltd. within the meaning of Section 1.5 of NI 43-101.

8) I was paid a daily rate for engineering consulting services performed in evaluation of Fire Creek for Klondex Mines Ltd. and do not have any other interests relating to the project. I do not have any interest in adjoining properties in the Fire Creek Project area.

9) I have read NI 43-101 and Form 43-101F1, and the sections of the Technical Report for which I am responsible have been prepared in accordance with that instrument and form.

10) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

11) As at the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 24th day of July, 2014,

"Signed" *Mark Odell*

Mark A. Odell, P.E.

Practical Mining LLC
495 Idaho Street, Suite 205
Elko, Nevada 89801
775-345-3718
markodell@practicalmining.com

CONSENT OF QUALIFIED PERSON

TO: British Columbia Securities Commission
Alberta Securities Commission
Saskatchewan Financial Services Commission
The Manitoba Securities Commission
Ontario Securities Commission
New Brunswick Securities Commission
Nova Scotia Securities Commission
Superintendent of Securities, Prince Edward Island Securities Office
Superintendent of Securities, Newfoundland and Labrador

I, Mark Odell, P.E., do hereby consent to the public filing of the technical report titled *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended***,** dated the 24th day of July, 2014, with an effective date of January 31, 2014 (Technical Report) by Klondex Mines Ltd. (Company) with the Canadian securities regulatory authorities listed above and on SEDAR.

The undersigned consents to the use of any extracts from or a summary of the Technical Report in the news release of the Company dated April 29, 2014 (Written Disclosure).

The undersigned certifies that he has read the Written Disclosure filed by the Company and that it fairly and accurately represents the information in the sections of the Technical Report for which the undersigned is responsible.

Dated this 24th day of July, 2014,

"Signed" *Mark Odell*

_____

Mark Odell, P.E.

Practical Mining LLC
495 Idaho Street, Suite 205
Elko, Nevada 89801
775-345-3718
markodell@practicalmining.com

CERTIFICATE OF AUTHOR

Re: *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended,* dated the 24th day of July, 2014, with an effective date of January 31, 2014.

I, Laura M. Symmes, SME, do hereby certify that:

As of July 24, 2014, I am a geologist at:

Practical Mining, LLC
495 Idaho Street, Suite 205
Elko, NV 89801

1) I graduated with a Bachelor of Science degree in Geology from Utah State University in 2003.
2) I am a registered member of the Society for Mining, Metallurgy & Exploration (SME) #4196936.
3) I have worked as a geologist for a total of 11 years since my 2003 graduation from university. My experience has been focused on exploration and production of gold deposits, including planning and supervision of drill projects, generating data from drilled materials and making geologic interpretations, data organization, geologic mapping, building digital models of geologic features and mineral resources, and grade control of deposits in production.
4) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the Purposes on NI 43-101.
5) I am responsible for sectios 4 and 6-12 of the technical report titled *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended,* dated the 24th day of July, 2014, with an effective date of January 31, 2014 (the Technical Report). I last visited the site on December 17, 2013.
6) I have not had prior involvement with the property that is the subject of the Technical Report.
7) I am independent of Klondex Mines Ltd. within the meaning of Section 1.5 of National Instrument 43-101.
8) I was paid a daily rate for consulting services performed in evaluation of the Fire Creek Project and do not have any other interests relating to the project. I do not have any interest in adjoining properties in the Fire Creek Project area.

9) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

10) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

11) As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 24th day of July, 2014

"Signed" Laura M. Symmes

Laura M. Symmes, SME **SME No. 4196936**

Practical Mining LLC
495 Idaho Street, Suite 205
Elko, NV 89801
775-345-3718
Fax: (501) 638-9162
laurasymmes@practicalmining.com

CONSENT OF QUALIFIED PERSON

TO: British Columbia Securities Commission
Alberta Securities Commission
Saskatchewan Financial Services Commission
The Manitoba Securities Commission
Ontario Securities Commission
New Brunswick Securities Commission
Nova Scotia Securities Commission
Superintendent of Securities, Prince Edward Island Securities Office
Superintendent of Securities, Newfoundland and Labrador

I, Laura Symmes, SME., do hereby consent to the public filing of the technical report titled *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended***,** dated the 24th day of July, 2014, with an effective date of January 31, 2014 (Technical Report) by Klondex Mines Ltd. (Company) with the Canadian securities regulatory authorities listed above and on SEDAR.

The undersigned consents to the use of any extracts from or a summary of the Technical Report in the news release of the Company dated April 29, 2014 (Written Disclosure).

The undersigned certifies that she has read the Written Disclosure filed by the Company and that it fairly and accurately represents the information in the sections of the Technical Report for which the undersigned is responsible.

Dated this 24th day of July, 2014,

"Signed" *Laura Symmes*

_____

Laura Symmes, SME

Practical Mining LLC
495 Idaho Street, Suite 205
Elko, Nevada 89801
775-345-3718
laurasymmes@practicalmining.com

CERTIFICATE OF AUTHOR

Re: *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended*, dated the 24th day of July, 2014, with an effective date of January 31, 2014.

I, Sarah M Bull, P.E., do hereby certify that:

As of July 24, 2014, I am a consulting mining engineer at:

Practical Mining LLC
495 Idaho Street, Suite 205
Elko, Nevada 89801
775-345-3718

1) I am a Registered Professional Mining Engineer in the State of Nevada (# 22797).

2) I am a graduate of The University of Alaska Fairbanks, Fairbanks, Alaska with a Bachelor of Science Degree in Mining Engineering in 2006.

3) Since my graduation from university I have been employed as a Mine Engineer at an underground gold mining operation and as Senior Mine Engineer for a consulting engineering firm. My responsibilities have included mine ventilation engineering, stope design and mine planning.

4) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my experience and qualifications and good standing with proper designation within a recognized professional organization fully meet the criteria as a Qualified Person as defined under the terms of NI 43-101.

5) I am a contract consulting engineer for the issuer and Project owner: Klondex Mines Ltd.

6) I am responsible for preparation of section 15 of the technical report titled *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended*, dated the 24th day of July, 2014,, with an effective date of January 31, 2014 (Technical Report). I have not inspected the project site.

7) I am independent of Klondex Mines Ltd. within the meaning of Section 1.5 of NI 43-101.

8) I was paid a daily rate for engineering consulting services performed in evaluation of the Fire Creek Project for Klondex Mines Ltd. and do not have any other interests relating to the project. I do not have any interest in adjoining properties in the Fire Creek Project area.

9) I have read NI 43-101 and Form 43-101F1, and the sections of the Technical Report for which I am responsible have been prepared in accordance with that instrument and form.

10) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

11) As at the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 24th day of July, 2014,

"Signed" *Sarah Bull*

Sarah M Bull, P.E.

Practical Mining LLC
495 Idaho Street, Suite 205
Elko, Nevada 89801
775-304-5836
sweetsarah_c@hotmail.com

CONSENT OF QUALIFIED PERSON

TO: British Columbia Securities Commission
Alberta Securities Commission
Saskatchewan Financial Services Commission
The Manitoba Securities Commission
Ontario Securities Commission
New Brunswick Securities Commission
Nova Scotia Securities Commission
Superintendent of Securities, Prince Edward Island Securities Office
Superintendent of Securities, Newfoundland and Labrador

I, Sarah Bull, P.E., do hereby consent to the public filing of the technical report titled *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended***,** dated the 24th day of July, 2014, with an effective date of January 31, 2014 (Technical Report) by Klondex Mines Ltd. (Company) with the Canadian securities regulatory authorities listed above and on SEDAR.

The undersigned consents to the use of any extracts from or a summary of the Technical Report in the news release of the Company dated April 29, 2014 (Written Disclosure).

The undersigned certifies that she has read the Written Disclosure filed by the Company and that it fairly and accurately represents the information in the sections of the Technical Report for which the undersigned is responsible.

Dated this 24th day of July, 2014,

"Signed" *Sarah Bull*

_____

Sarah Bull, P.E.

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Fax: (501) 638-9162

CERTIFICATE OF AUTHOR

Re: *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended*, dated the 24th day of July, 2014, with an effective date of January 31, 2014.

I, Karl T. Swanson, SME, MAusIMM, do hereby certify that:

As of July 24, 2014, I am an independent geological and mining engineering consultant at:
Karl Swanson
PO Box 86
Larkspur, CO 80118, USA

1) I graduated with a Bachelor of Science degree in Geological Engineering from Colorado School of Mines in 1990. In addition, I obtained a Master of Engineering degree in Mining Engineering from Colorado School of Mines in 1994.

2) I am a registered member of the Society for Mining, Metallurgy & Exploration (SME) #4043076. I am a member of the Australian Institute of Mining and Metallurgy (AusIMM) #304871.

3) Since my 1990 graduation from university I have been employed as a geologic modeller and resource geologist for metal mining companies and consulting groups. For the past 17 years, I have been a self-employed consulting geologist specializing in digital geologic modelling, geostatistical grade estimation and block modelling for precious metal, base metal and industrial mineral deposits. I have been the principle geostatistician and modeller for several narrow vein gold deposits in the Northern Nevada Rift for over 5 years.

4) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the Purposes on NI 43-101.

5) I am responsible for Section 14 of the technical report titled *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended,* dated the 24th day of July, 2014, with an effective date of January 31, 2014 (Technical Report).

6) I last visited the Fire Creek site on September 6, 2013.

7) I have not had prior involvement with the property that is the subject of the Technical Report.

8) I am independent of Klondex Mines, Ltd. within the meaning of Section 1.5 of NI 43-101.

9) I was paid a daily rate for engineering consulting services performed in evaluation of Fire Creek and do not have any other interests relating to the project. I do not have any interest in adjoining properties in the Fire Creek area.

10) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

11) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

12) As at the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

DATED the 24th day of July, 2014,

"Signed" *Karl T. Swanson*

Karl T. Swanson, M.Eng., SME, MAusIMM

AusIMM No. 304871

SME No. 4043076

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CONSENT OF QUALIFIED PERSON

TO: British Columbia Securities Commission
Alberta Securities Commission
Saskatchewan Financial Services Commission
The Manitoba Securities Commission
Ontario Securities Commission
New Brunswick Securities Commission
Nova Scotia Securities Commission
Superintendent of Securities, Prince Edward Island Securities Office
Superintendent of Securities, Newfoundland and Labrador

I, Karl Swanson, SME, MAusIMM, do hereby consent to the public filing of the technical report titled *Preliminary Economic Assessment of the Fire Creek Project, Lander County, Nevada, Amended***,** dated the 24th day of July, 2014, with an effective date of January 31, 2014 (Technical Report) by Klondex Mines Ltd. (Company) with the Canadian Securities Regulatory Authorities listed above and on SEDAR.

The undersigned consents to the use of any extracts from or a summary of the Technical Report in the news release of the Company dated April 29, 2014, 2014 (Written Disclosure).

The undersigned certifies that he has read the Written Disclosure filed by the Company and that it fairly and accurately represents the information in the sections of the Technical Report for which the undersigned is responsible.

DATED the 24th day of July, 2014,

"Signed" *Karl T. Swanson*

Karl T. Swanson, SME, MAusIMM

PO Box 86
Larkspur, CO 80118, USA
Fax: (501) 638-9162
Email: karl.swanson@yahoo.com